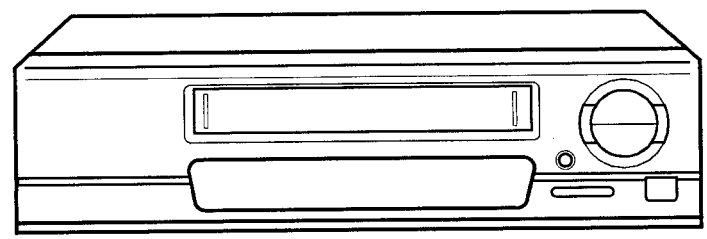
universum.

VR 2982

SERVICE MANUAL

VIDEO CASSETTE RECORDER

ORIGINAL
CHASSIS CODE A



VHS
PAL

SPECIFICATIONS

Power Source:	AC 230V, 50Hz
Power Consumption:	Approx. 14W
Operation Temperature:	5℃ to 40℃
Television System:	CCIR: 625 lines, 50 fields PAL B/G
Video Recording System:	VHS, 2 rotary heads, helical scanning system Luminance: FM azimuth recording Color signal: Converted subcarrier phase shift recording
Heads:	Video: 4 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase head
Audio Track:	1 track
Tape Width:	12.65mm high density tape
F.FWD/REW Time:	2'30" (with E-180 cassette)
RF Output Channel:	36 (23~69, Adjustable) channel
Tape Speed:	SP: 23.39 mm/s (PAL), 33.35 mm/s (NTSC) LP: 11.69 mm/s (PAL)
Input Level:	Video: 1.0Vp-p, 75 ohm unbalanced Audio: 500 mV, 50K ohm unbalanced
Output Level:	Video: 1.0Vp-p, 75 ohm unbalanced Audio: 500 mV, 1K ohm unbalanced
Weight:	4.0 Kg
Dimensions:	380(W) x 95(H) x 271.5(D) mm

Design and specifications are subject to change without notice.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

3. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

4. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)
1. MODEL NUMBER and CHASSIS CODE
   You can find it in the back of your unit.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

IMPORTANT NOTICE

The remote control for this model can be selected the Custom code 1 and Custom code 2.
•How to selection;

Custom code 1 : Press the Power key and 1 key on the remote control simultaneously for more than 2 seconds.
Custom code 2 : Press the Power key and 2 key on the remote control simultaneously for more than 2 seconds.

The Custom code 1 is only available for the VCR unit but the Custom code 2.
When selected the Custom code 2 by mistake, just remove the batteries from the remote control for the moment or select the Custom code 2 as described above.

CONTENTS

PAGE

SPECIFICATIONS ..... COVER
SERVICING NOTICES ON CHECKING 1
HOW TO ORDER PARTS 1
IMPORTANT NOTICE 1
CONTENTS 2
DISASSEMBLY INSTRUCTIONS
1. REMOVAL OF MECHANICAL PARTS AND P. C. BOARDS 3, 4
2. REMOVAL OF DECK PARTS ..... 5~9
KEY TO ABBREVIATIONS 10, 11
PREVENTIVE CHECKS AND SERVICE INTERVALS 12
DECK PARTS LOCATIONS 13, 14
SERVICING FIXTURES AND TOOLS 15
PREPARATION FOR SERVICING 15
TO CHECK INITIAL SETTING 16
MECHANICAL ADJUSTMENTS
1. CONFIRMATION AND ADJUSTMENT
1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT 17
1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION 17
1-3: CONFIRMATION AND ADJUSTMENT OF BACK TENSION ON PLAYBACK 17
1-4: CONFIRMATION OF FAST FORWARD TORQUE 18
1-5: CONFIRMATION OF REWIND TORQUE 18
1-6: CONFIRMATION OF REEL BRAKE TORQUE 18
2. TAPE RUNNING CONFIRMATION AND ADJUSTMENT
2-1: GUIDE ROLLER 18
2-2: CONFIRMATION AND ADJUSTMENT OF A/C HEAD TILT 19
2-3: ADJUSTMENT OF A/C HEAD HEIGHT AND AZIMUTH 19
2-4: TAPE RUNNING ADJUSTMENT 19

PAGE

ELECTRICAL ADJUSTMENT
3. ADJUSTMENT PROCEDURE
3-1: PG SHIFTER 20
MAJOR COMPONENTS LOCATION GUIDE 21
BLOCK DIAGRAMS
Y/C/AUDIO/HEAD AMP 22
SYSTEM CONTROL/SERVO/TUNER/21PIN/OSD 23
OPERATION/POWER 24
PRINTED CIRCUIT BOARDS
SYSCON 25, 26
OPERATION 27
SCHEMATIC DIAGRAMS
Y/C/AUDIO 28
TUNER 29
HEAD AMP 30
SYSTEM CONTROL/SERVO 31
21PIN/OSD 32
POWER 33
OPERATION 34
INTERCONNECTION DIAGRAM 35
WAVEFORMS 36
MECHANICAL EXPLODED VIEW 37
MECHANICAL REPLACEMENT PARTS LIST 38
CHASSIS EXPLODED VIEW (TOP VIEW) 39
CHASSIS EXPLODED VIEW (BOTTOM VIEW) 40
FRONT LOADING UNIT EXPLODED VIEW 41
CHASSIS/FRONT LOADING UNIT REPLACEMENT PARTS LIST 42
ELECTRICAL REPLACEMENT PARTS LIST 43, 44

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

CAUTION: BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1-1: TOP CABINET, FRONT CABINET AND OPERATION PCB (Refer to Fig. 1-1)

1. Remove the 4 screws①.
2. Remove the Top Cabinet.
3. Disconnect the following connector: (CP651 3 pins).
4. Unlock the 7 supports ②.
5. Remove the Front Cabinet.
6. Remove the 5 screws③ and remove the Operation PCB.

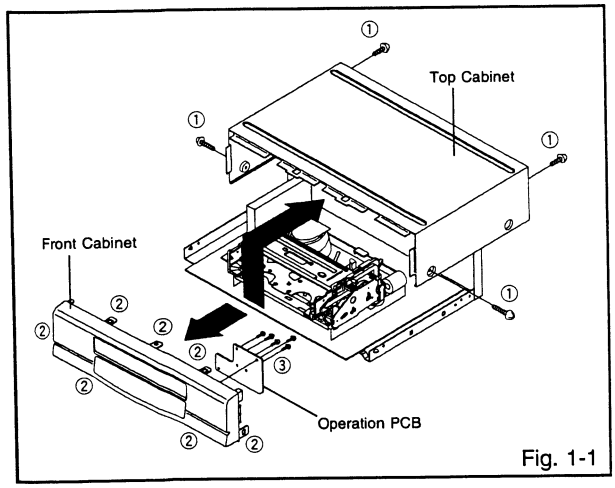


Fig. 1-1

1-2: FLAP (Refer to Fig. 1-2)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).

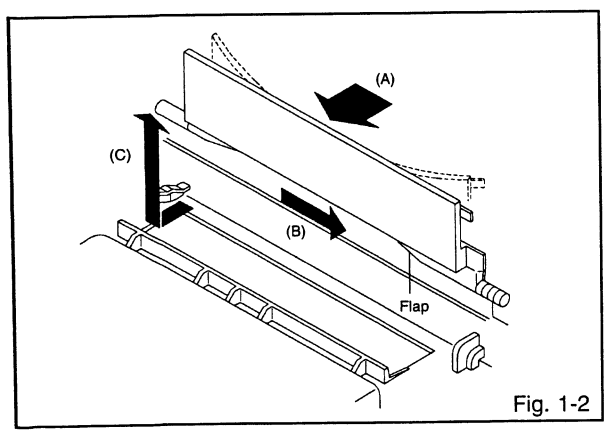


Fig. 1-2

1-3: DECK CHASSIS (Refer to Fig. 1-3)

1. Remove the 2 screws ① and remove the Shield Case.
2. Remove the screw ②.
3. Remove the 2 screws ③.
4. Remove the screw ④.
5. Remove the screw ⑤.
6. Disconnect the following connectors: (CD1001 2 pins, CP4002 2 pins, CP4101 6 pins, CP4102 5 pins and CP4106 6 pins) and remove the Deck Chassis.

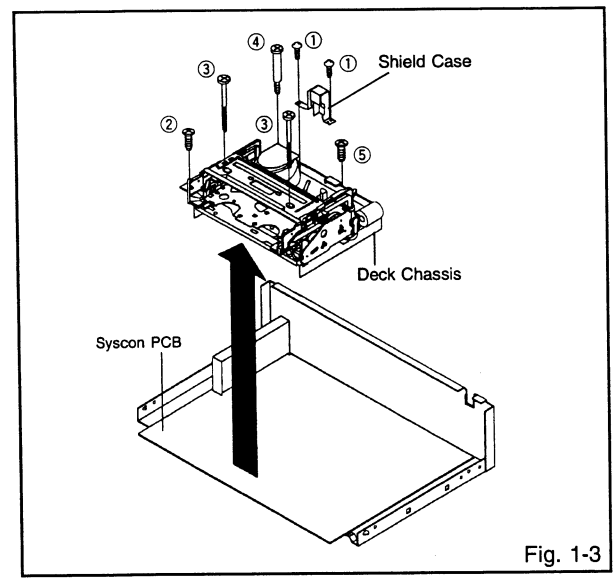


Fig. 1-3

1-4: SYSCON PCB AND BOTTOM PLATE (Refer to Fig. 1-4)

1. Remove the 2 screws ①.
2. Remove the screw②.
3. Remove the screws ③.
4. Remove the Syscon PCB.

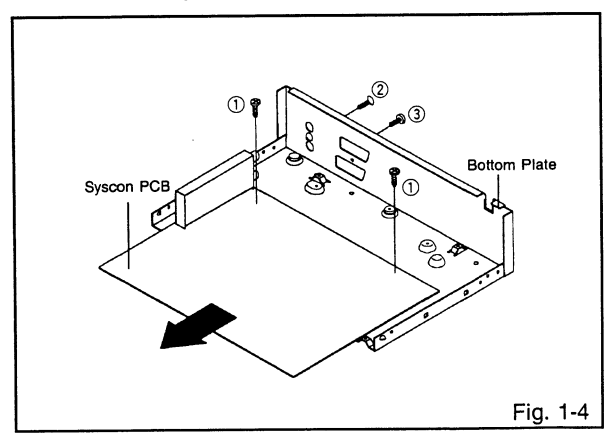


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

1-5: FRONT LOADING UNIT
(Refer to Fig. 1-5)

1. Remove the screw ①
2. Remove the screw ②
3. Remove the Front Loading Unit.

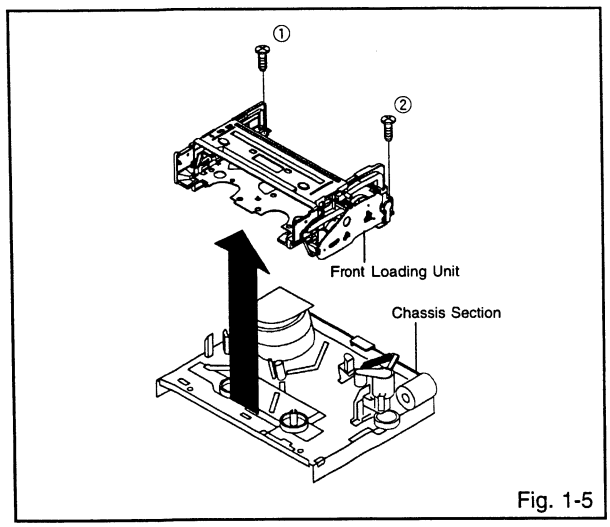


Fig. 1-5

NOTE: When installing the Front Loading Unit, align the timing marks and pull the Cassette Holder Ass'y in the direction of arrow (A). **(Refer to Fig. 1-6)**

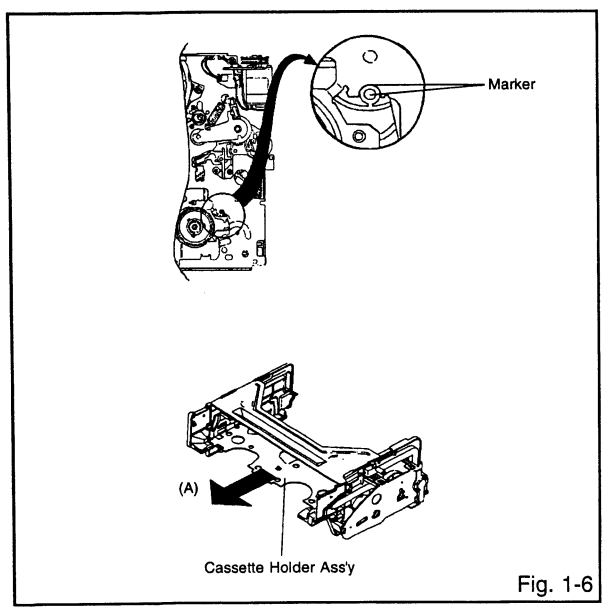


Fig. 1-6

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

2-1: LINK GEAR (R) / CAM GEAR (Refer to Fig. 2-1)

1. Unlock the support①.
2. Remove the BOT Sensor Cover and BOT Reflector.
3. Unlock the 3 supports②.
4. Remove the Side Bracket R2 and Spring Earth.
5. Remove the Flap Lever, Link Gear (R) , Cam Gear Ass'y and BOT Lever.

NOTE

When installing the Link Ass'y and Link Gear (R), align the timing Marks.

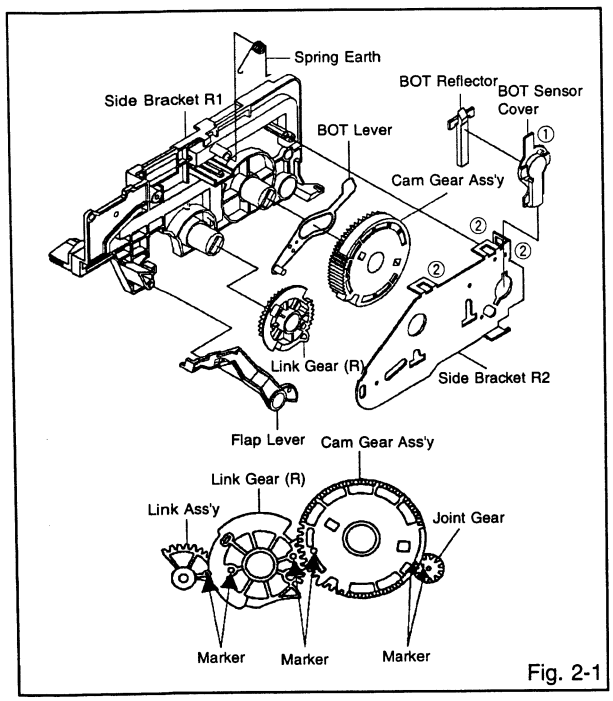


Fig. 2-1

2-2: TOP BRACKET / JOINT GEAR (Refer to Fig. 2-2)

1. Unlock the 4 supports①.
2. Remove the Top Bracket.
3. Remove the Side Bracket R1 and Side Bracket L.
4. Unlock the support②.
5. Remove the Joint Gear.
6. Remove the Bracket R Spring.

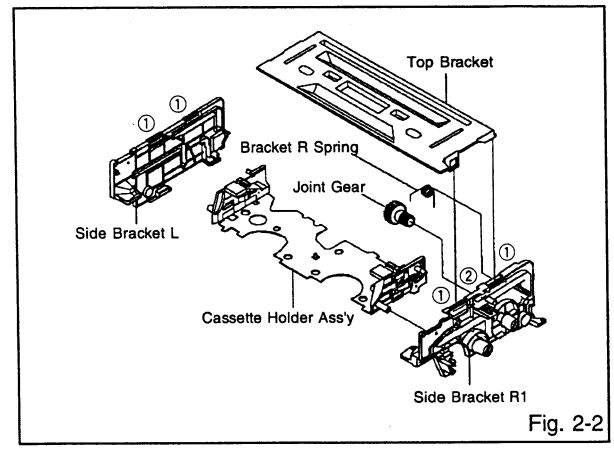


Fig. 2-2

2-3: LINK ASS'Y (Refer to Fig. 2-3)

1. After removing in the direction (A) of Link Ass'y, remove the Link Ass'y in the direction (B).

NOTE

Install the (B) first, then install the (A).

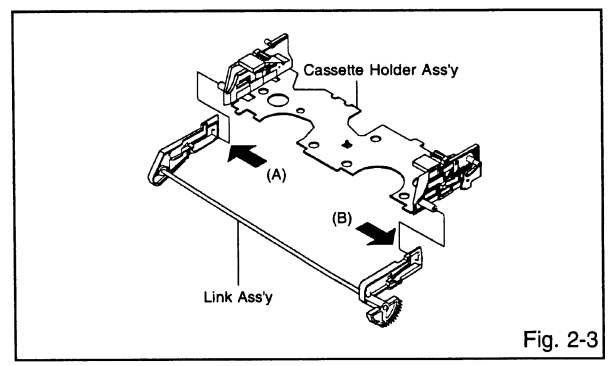


Fig. 2-3

2-4: CASSETTE SIDE R (Refer to Fig. 2-4)

1. Unlock the 2 supports①.
2. Remove the Cassette Side R.
3. Remove the Pack Spring.
4. Remove the Locker Spring.
5. Unlock support ②
6. Remove the Locker R.

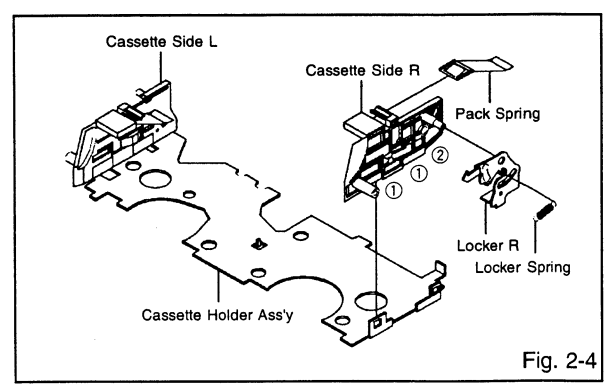


Fig. 2-4

DISASSEMBLY INSTRUCTIONS

2-5: CASSETTE SIDE L (Refer to Fig. 2-5)

1. Unlock the 2 supports①.
2. Remove the Cassette Side L.
3. Remove the Pack Spring.
4. Remove the Locker Spring.
5. Unlock the support②.
6. Remove the Locker L.

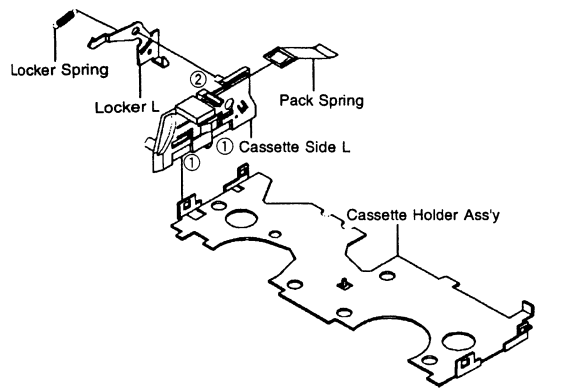


Fig. 2-5

2-6: BRAKE BRACKET (Refer to Fig. 2-6)

1. Remove the Main Brake Spring, S-S Brake Spring, Joint Arm Spring and T-S Brake Spring.
2. Remove the 2 screws①.
3. Remove the screw②.
4. Remove the Brake Bracket.
5. Remove the Sub Brake S, Sub Brake T, Main Brake S Ass'y and Main Brake T Ass'y.
6. Remove the Joint Arm.
7. Remove the Reflector LED 2.

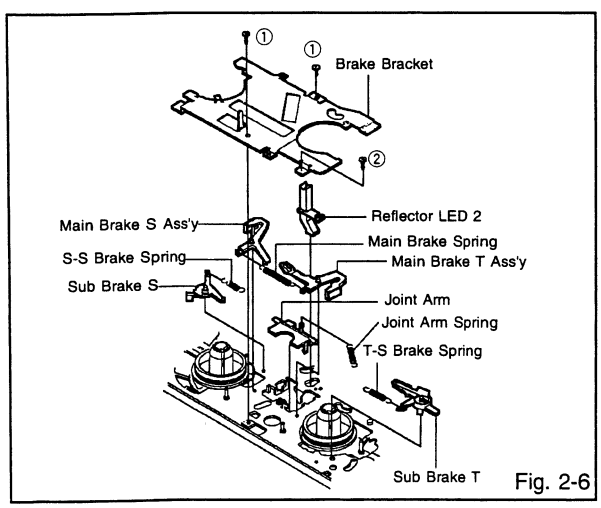


Fig. 2-6

2-7: TENSION BAND (Refer to Fig. 2-7)

1. Remove the Tension Arm Spring 1.
2. Remove the Tension Arm Spring 2.
3. Remove the Tension Adjust.
4. Remove the Tension Arm Ass'y.
5. Remove the Tension Band Ass'y.
6. Remove the Tension Lever 2 Ass'y.

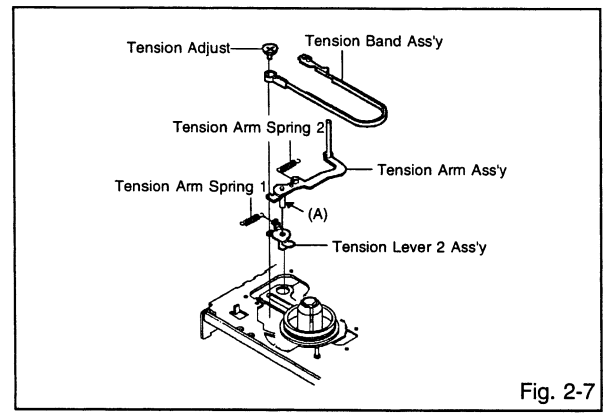


Fig. 2-7

NOTE

1. Install the Tension Band Ass'y without twisting it.
2. Turbine Oil (Lubricating Grade #150) the area marked with A in **Fig. 2-7.**

EX: KYOUDO Oil Sulaidasu #150
IDEMITSU Oil Super Multi #150

2-8: REEL DISK (Refer to Fig. 2-8)

1. Remove the Reel Disk S and Reel Disk T.
2. Remove the 2 polyslider washers.

NOTES

1. Installation of Reel Disk after performing step 1, 2 and 3 in section 2-7 of DISASSEMBLY INSTRUCTIONS.
2. The Height Adjustment washers are sometimes attached to the back of the Reel Disk.
3. Clean the Reel Disk Shaft and put in height adjusting washers.
4. Be careful not to damage the Tension Band Ass'y at the time of removal and installation.
5. Be careful not to scratch the Reel Disk Shaft with the polyslider washer or the tool at the time of removal and installation.
6. After oiling (Lubricating Grade #150) the Reel Disk Shaft, install the new Reel Disk S and Reel Disk T again.

EX: KYOUDO Oil Sulaidasu #150
IDEMITSU Oil Super Multi #150

7. After installation, adjust the height of the Reel Disk. **(Refer to item 1-1 of MECHANICAL ADJUSTMENTS)**
8. After installation, adjust and confirm the tension post position. **(Refer to item 1-2 of MECHANICAL ADJUSTMENTS)**

DISASSEMBLY INSTRUCTIONS

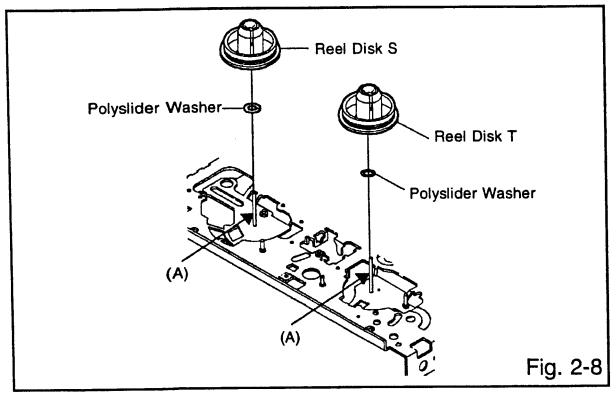


Fig. 2-8

2-9: PINCH ROLLER / CASSETTE OPENER (Refer to Fig. 2-9)

1. Unlock the support ①
2. Remove the Pinch Roller.
3. Remove the screw②.
4. Unlock the 2 supports ③
5. Remove the Cassette Opener.
6. Remove the Spring P5 and Arm P5 Ass'y.
7. Remove the Cam Gear, Polyslider Washer④, Spring Cam Pinch and Cam Pinch Roller.
8. Remove the Polyslider Washer⑤ and Cam P5.

NOTES

1. Do not touch the Pinch Roller. (Use gloves.)
2. When installing the Cam P5, Cam Pinch Roller and Cam Gear, align the timing marks.

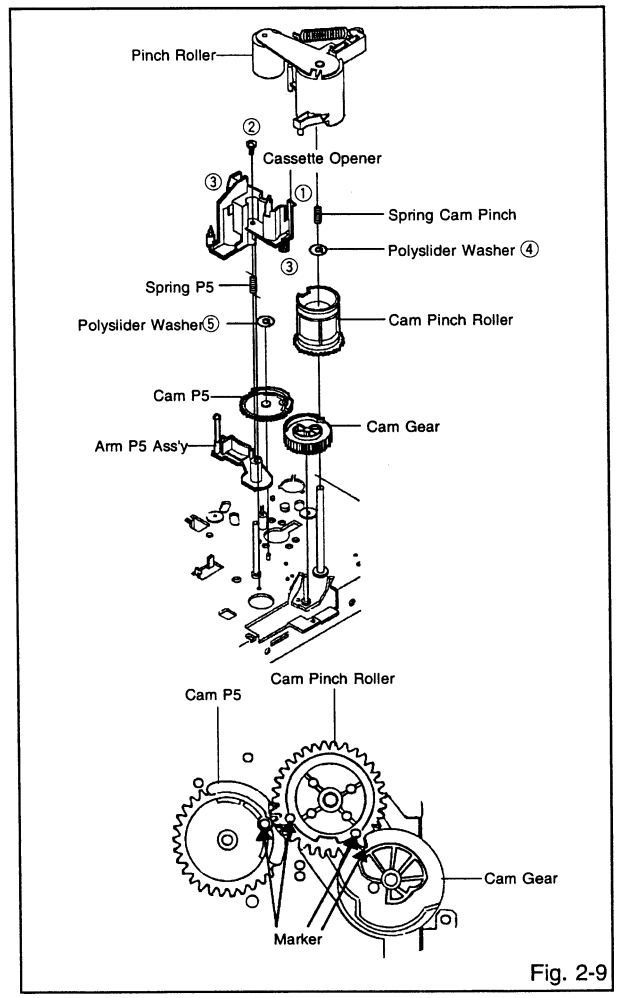


Fig. 2-9

2-10: AUDIO CONTROL HEAD (Refer to Fig. 2-10)

1. Remove the 3 screws①.
2. Remove the 3 Audio Control Head Springs.
3. Remove the Audio Control Head.

NOTES

1. Do not touch the head by any means when replacing the Audio Control Head. (Use gloves.)
2. After replacement, confirm the following adjustments.
   a. MECHANICAL ADJUSTMENTS: ITEM 2-2
   b. MECHANICAL ADJUSTMENTS: ITEM 2-3

DISASSEMBLY INSTRUCTIONS

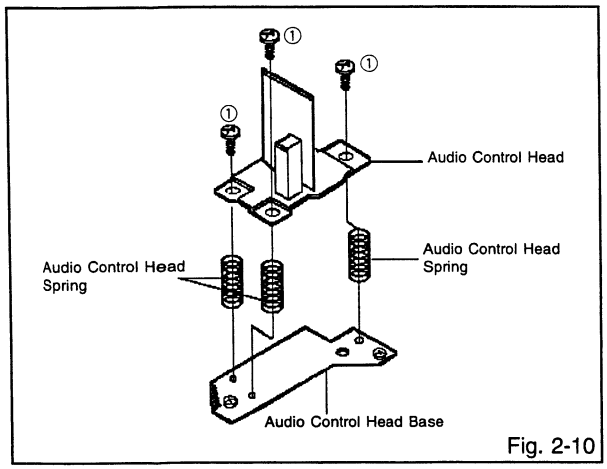


Fig. 2-10

2-11: CYLINDER UNIT (Refer to Fig. 2-11)

1. Remove the Joint Screw, then remove the Azimuth Spring.
2. Remove the 2 screws①, then remove the Cylinder Unit from the Main Chassis.

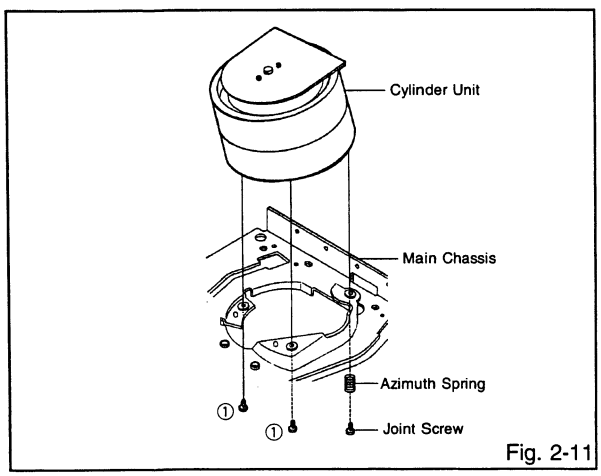


Fig. 2-11

2-12: PLATE BOTTOM (Refer to Fig. 2-12)

1. Remove the Capstan Belt.
2. Remove the 2 screws①.
3. Remove the 3 screws②.
4. Remove the Mode Switch.
5. Remove the Tension Lever Spring.
6. Remove the Plate Bottom.

NOTE

When installing the Mode Switch, align the timing position.

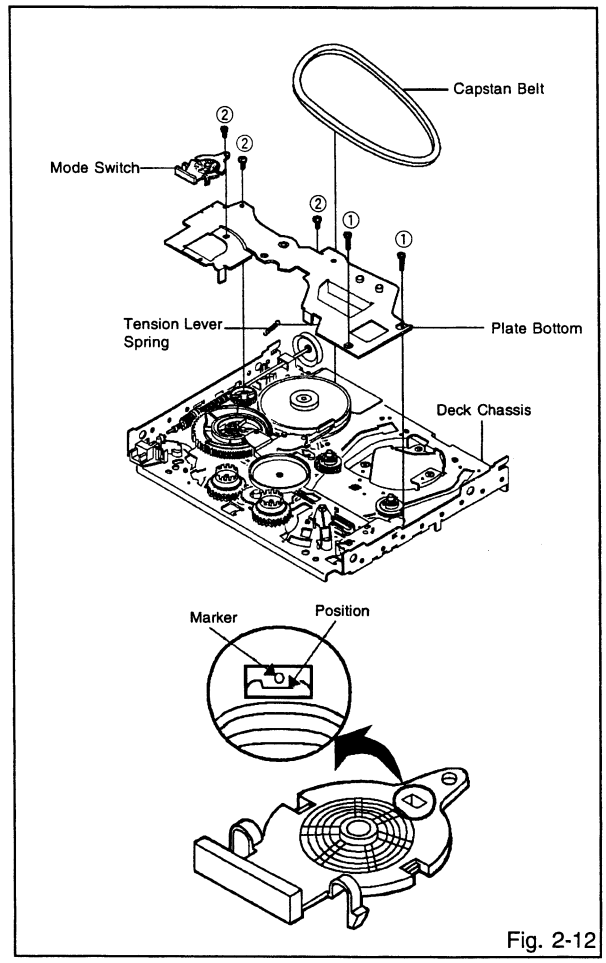


Fig. 2-12

2-13: CENTER PULLEY (Refer to Fig. 2-13)

1. Remove the polyslider washer①.
2. Remove the Center Pulley.
3. Remove the polyslider washer②.
4. Remove the Center Pulley Spring.
5. Remove the Idler Arm Ass'y.
6. Remove the 2 polyslider washers③.
7. Remove the Clutch Gear T Ass'y and Clutch Gear S Ass'y.

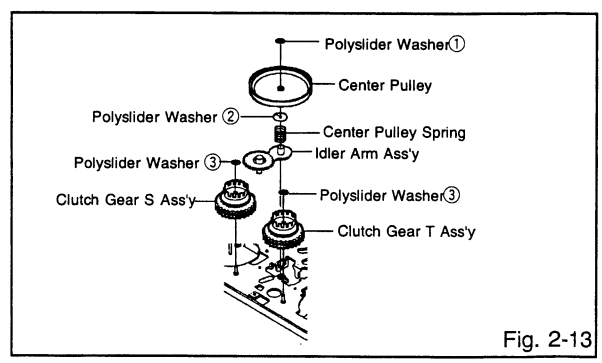


Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: MAIN CAM (Refer to Fig. 2-14)

1. Remove the Loading Lever.
2. Remove the Main Brake Lever.
3. Remove the Capstan Brake Spring.
4. Remove the Capstan Brake Ass'y.
5. Remove the Tension Holder.
6. Remove the Tension Lever.
7. Remove the Main Cam.
8. Remove the Middle Gear.
9. Remove the Main Rod Ass'y.
10. Remove the Tension Stopper.

NOTES

1. When installing the Main Rod Ass'y, install side (B) first, then install side (A).
2. When installing the Loading Lever, align the timing marks.

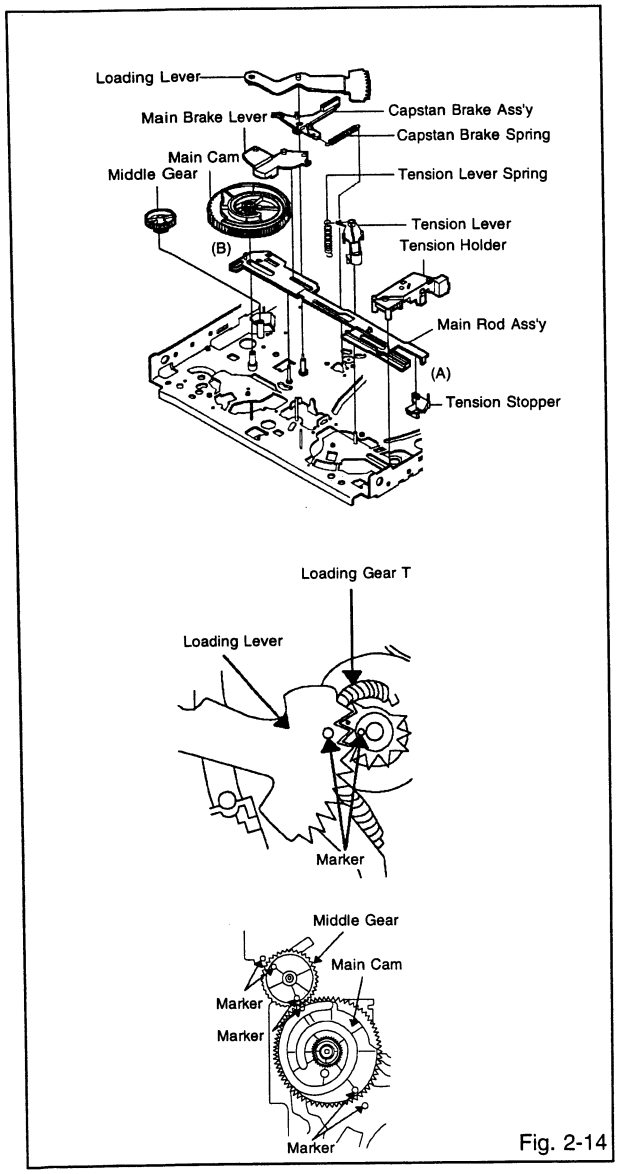


Fig. 2-14

2-15: CAPSTAN DD UNIT (Refer to Fig. 2-15)

1. Remove the 3 screws①.
2. Remove the Capstan DD Unit.

NOTE

Use the specified screw to hold the Capstan DD Unit.

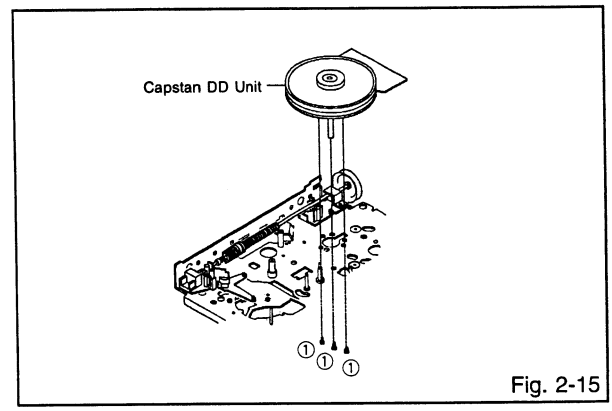


Fig. 2-15

2-16: INCLINED T ASS'Y / INCLINED S ASS'Y (Refer to Fig. 2-16)

1. Remove the 4 screws①.
2. Remove the Catcher S and Catcher T.
3. Remove the 2 CS Rings.
4. Remove the Inclined T Ass'y and Inclined S Ass'y.
5. Remove the Loading Gear T Ass'y.
6. Remove the Loading Gear S Ass'y.

NOTE

When installing the Inclined T Ass'y and Inclined S Ass'y, align the timing marks.

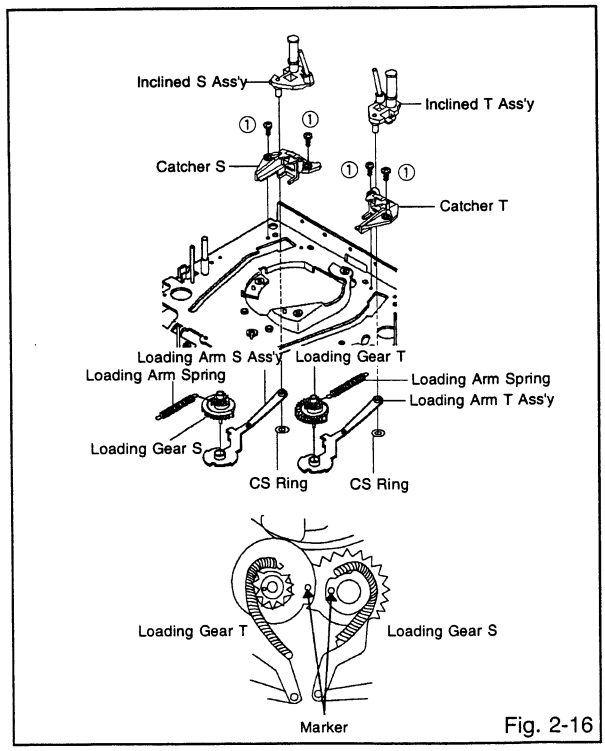


Fig. 2-16

KEY TO ABBREVIATIONS

A	A/C	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	BGP	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	C	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	DATA (SY-CE)	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	E	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	F	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	GEN	:	Generator
	GND	:	Ground
H	H.P.F	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	IC	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	KIL	:	Killer
L	L	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	M	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mech State Switch
N	NC	:	Non Connection
	NR	:	Noise Reduction
O	OSC	:	Oscillator
	OPE	:	Operation
P	PB	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	R	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	S. CLK	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head	■	■	■	■	■	
Loading Motor Belt			■	■	●	Clean the rubber, and parts which the rubber touches.
Reel Belt			■	■	●	
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■	■	■	●	Clean the Head.

● : Replace ■ : Clean

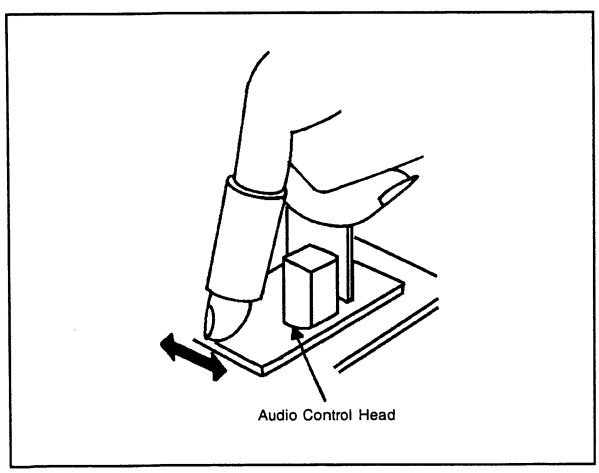
CLEANING

NOTE

○ After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

○ Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below)**



2. TAPE RUNNING SYSTEM

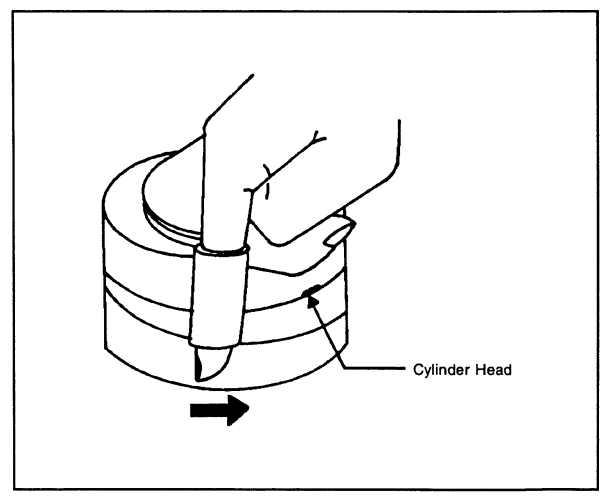
○ When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

○ Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below)**

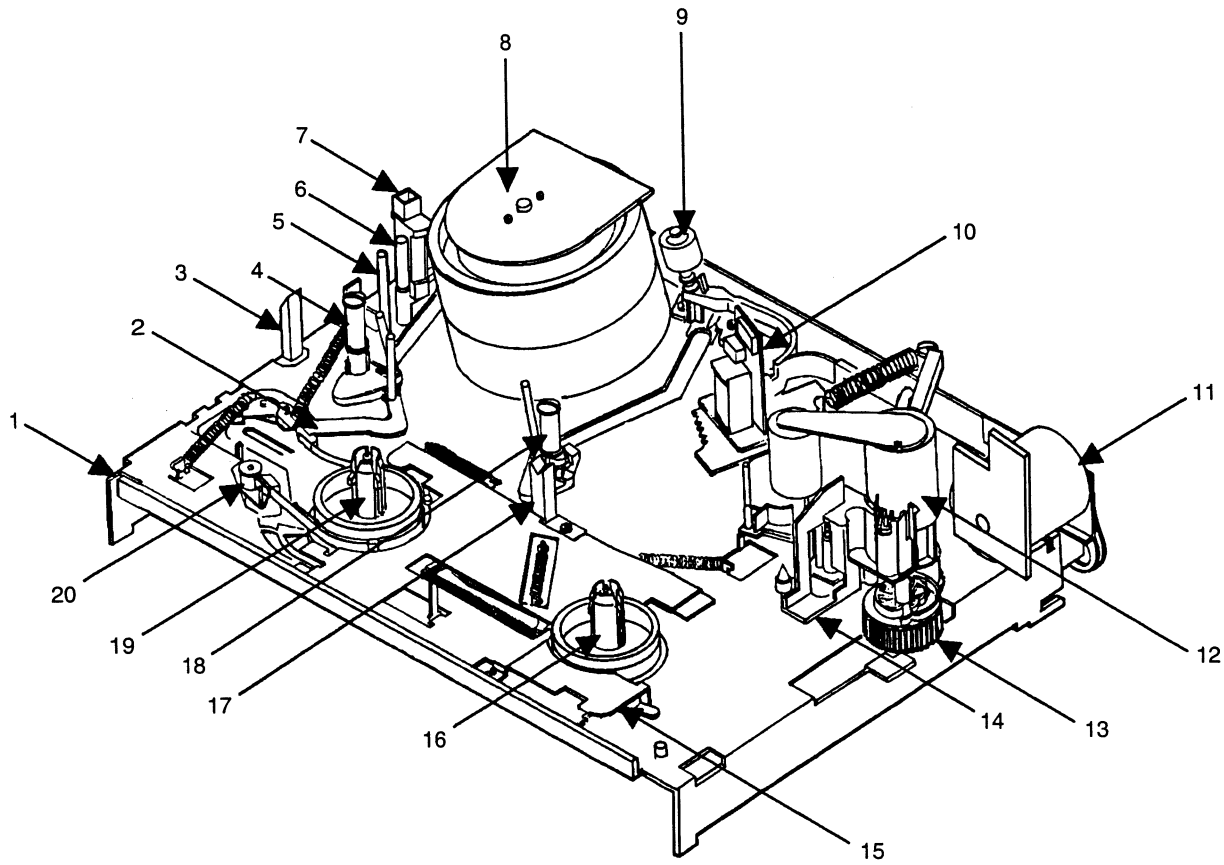
NOTE

Do not exert force against the cylinder head. Do not move the chamois up or down since this can damage the head. Always use a piece of chamois for cleaning.



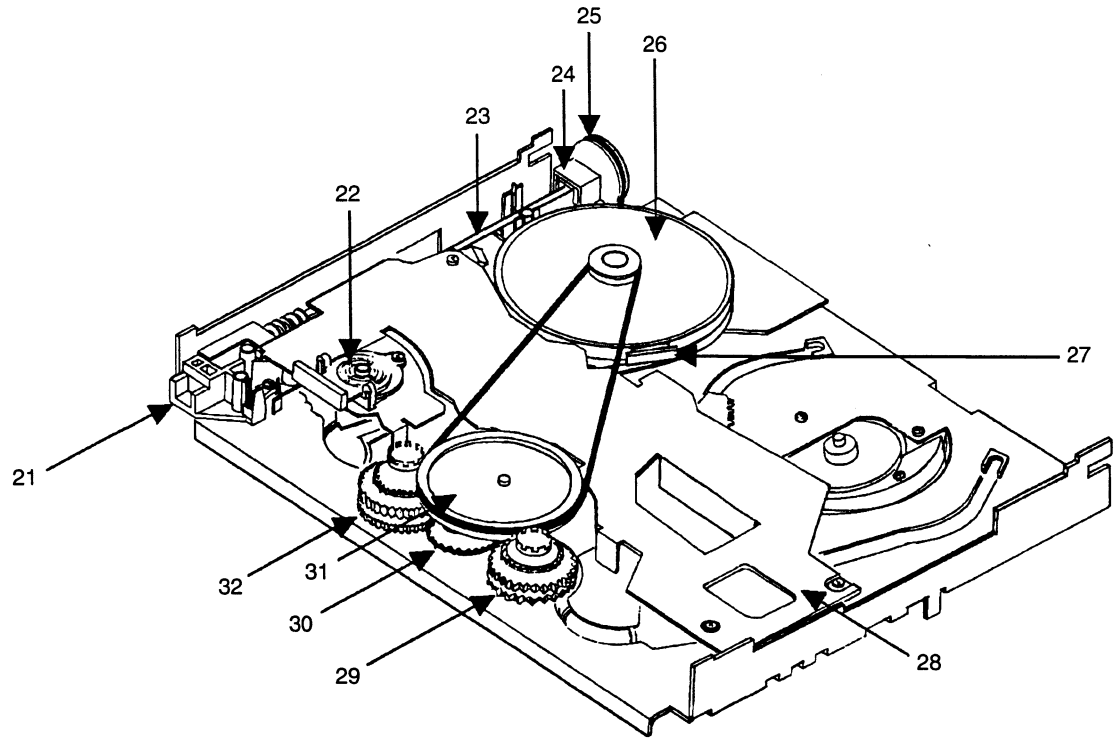
DECK PARTS LOCATIONS

(TOP VIEW)



1. Main Chassis
2. Tension Arm Ass'y
3. EOT Reflector
4. Guide Roller S Ass'y
5. P0 Post
6. P1 Post
7. FE Head
8. Cylinder Unit
9. Auto Head Cleaning
10. Audio/Control Head
11. Loading Motor Ass'y
12. Pinch Roller Block
13. Cam Gear
14. Cassette Opener
15. Brake Bracket
16. Reel T
17. LED Reflector
18. Guide Roller T Ass'y
19. Reel S
20. Tension Band Ass'y

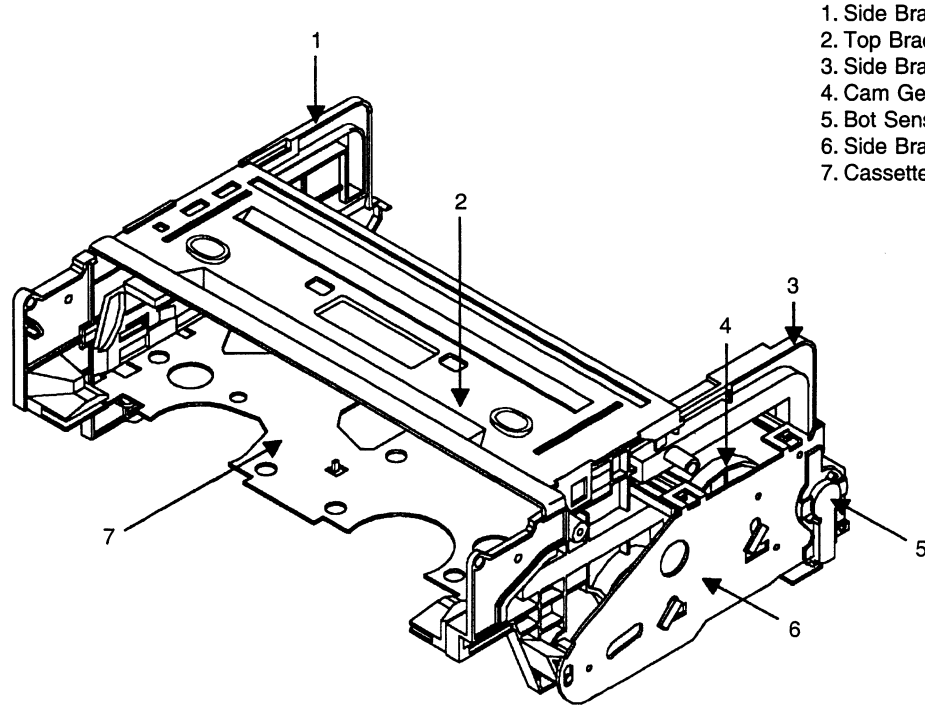
DECK PARTS LOCATIONS
(BOTTOM VIEW)



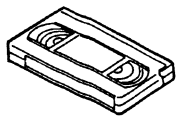
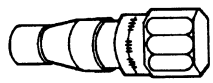
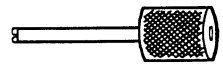
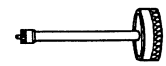
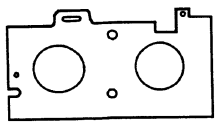
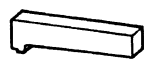
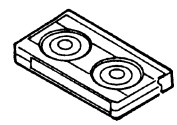
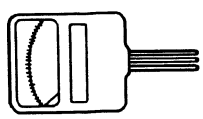
21. Worm Bracket F Ass'y
22. Mode Switch
23. Worm Ass'y
24. Worm Bracket R Ass'y
25. Loading Motor Belt
26. Capstan DD Unit
27. Capstan Brake Ass'y
28 Bottom Plate
29. Clutch Gear S Ass'y
30. Idler Arm Ass'y
31. Center Pulley
32. Clutch Gear T Ass'y

(FRONT LOADING UNIT)

1. Side Bracket L
2. Top Bracket Ass'y
3. Side Bracket R Ass'y
4. Cam Gear Ass'y
5. Bot Sensor Cover
6. Side Bracket R2
7. Cassette Holder Ass'y



SERVICING FIXTURES AND TOOLS

VHS Alignment Tape JG001E (VP_1 S-LI6[3]) JG001F (VP_1 S-CO1[3]) 	JG002B Adapter JG002F Dial Torque Gauge (60~600gf•cm) JG002G (100~1200gf•cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small) 	JG153 X Value Adjustment Screwdriver 
JG022 Master Plane 	JG024 Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 	JG154 Cable
Tentelometer 			

Part No.	Remarks
JG001E	Monoscope, 6KHz
JG001F	Color Bar, 1KHz
JG002F	Playback Take Up Torque
JG002G	Fast Forward Torque, Rewind Torque, Brake Torque (Take up Reel/Supply Reel)
JG005	Guide Roller Adjustment
JG153	X-Value Adjustment
JG022/JG024	Reel Disk Height Adjustment
JG100A	Playback Back Tension Torque
JG154	Used to connect the test point of SERVICE and GROUND

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Short circuit between **TP1010** and **TP1011** with the cable JG154.
   (Refer to MAJOR COMPONENTS LOCATION GUIDE)
   The EOT, BOT and Reel Sensor do not work at this moment.
   At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

TO CHECK INITIAL SETTING

NOTE: If there is an error in the data, the unit may indicate a malfunction.

INSTRUCTIONS

1. Turn on the POWER and press both FF key and CH UP key on the set simultaneously for more than 2 seconds. The Initial Set Mode indicator will appear and the Address will blink.**(Refer to Fig. 1)**
2. Press the SET +/- button on the remote control to modify the address and check the data.**(Refer to Table 1)**
3. After checking, turn off the Power.

(If the wrong data is input)

4. Press the SET +/- button on the remote control to set to the address of the wrong data, then press the ENTER button. The data will bink.**(Refer to Fig. 1)**
5. Press the SET +/- button on the remote control to set to the correct data, then press the ENTER button.**(Refer to Table 1)**
6. Repeat the above steps 4 and 5 and input the data into the each Address.
7. After the data input, turn off the Power.

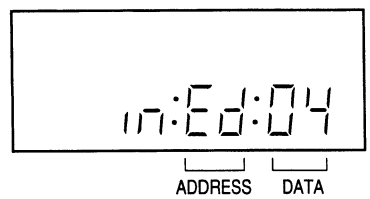


Fig. 1

ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA
E2	02	EC	30	F6	43
E3	82	ED	9B	F7	55
E4	04	EE	06	F8	B4
E5	00	EF	00	F9	FF
E6	06	F0	A0	FA	3A
E7	03	F1	EA		
E8	02	F2	CB		
E9	40	F3	5C		
EA	00	F4	00		
EB	00	F5	00		

Table 1

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTED items before starting work.

- Place an object which weighs between 350g and 500g on the Cassette Tape to keep it steady when you want to make the tape run without the Front Loading Unit. (Do not place an object which weighs over 500g.)
- When you activate the deck without the Front Loading Unit, short circuit between **TP1010** and**TP1011**. In this condition the BOT/EOT/Reel Sensor will not function.

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane**(JG022)** and reel disk height adjustment jig **(JG024)** on mechanism framework, taking care not to scratch the drum, as shown in**Fig. 1-1-A**.
3. Confirm that the reel disk is lower than "A" of the reel disk height adjustment jig**(JG024)** on the master plane and higher than "B" as shown in**Fig. 1-1-B**. If it is not, adjust to less than 7.5mm±0.2mm with the height adjustment washer.
4. Perform the same adjustment for other reel.

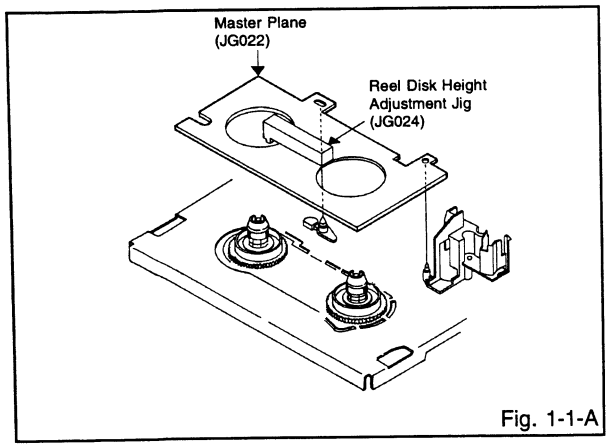


Fig. 1-1-A

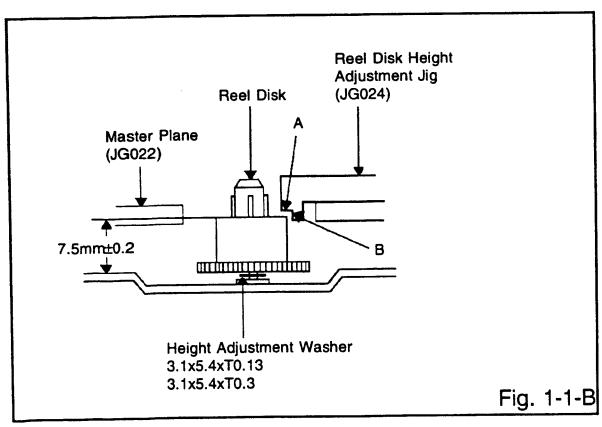


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Turn on the power and set to the PLAY mode adjust the Tension so that the Tension Post is at the position of 0.3mm~0.5mm from the Rib.**(Refer to Fig. 1-2)**
2. Confirm that the video tape is not curling at the flange of P1 post or is not running on flanges.

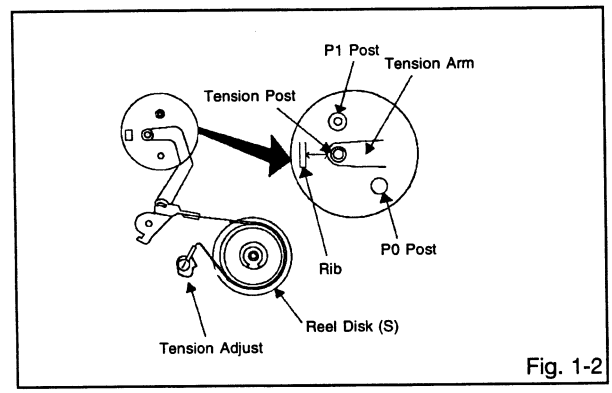


Fig. 1-2

1-3: CONFIRMATION AND ADJUSTMENT OF BACK TENSION ON PLAYBACK

1. Load a video tape recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in**Fig. 1-3**. Confirm the value is within 18~24gf at this time.

- IN CASE OF USING A CASSETTE TYPE TORQUE TAPE.

1. After adjustment, confirm and adjust the tension post position **(Refer to item 1-2)**or the tension arm, install the cassette type torque tape**(JG100A)** and set to the PLAY mode.
2. Confirm that the left hand side tension value of the torque tape is 20~35gf•cm for the standard mode tape.

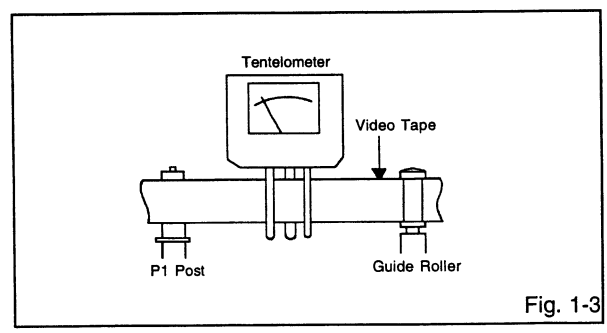


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF FAST FORWARD TORQUE

1. Set torque gauge **(JG002G)** on take-up reel disk, and place unit in FAST FORWARD mode.**(Refer to Fig. 1-4)**
2. Confirm that torque is more than 400gf•cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the FAST FORWARD button and the reel disk will begin to turn.

1-5: CONFIRMATION OF REWIND TORQUE

1. Operate within 4 or 5 seconds after the reel disk begins to turn.
2. Set torque gauge **(JG002G)** on supply reel disk, and place the unit in REWIND mode.**(Refer to Fig. 1-4)**
3. Confirm that torque is more than 400gf•cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the REWIND button and the reel disk will begin to turn.

1-6: CONFIRMATION OF REEL BRAKE TORQUE

(Take-Up Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the take-up reel and turn it counterclockwise.
3. Confirm that it is more than 200gf•cm at that time.

(Supply Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the supply reel and turn it clockwise.
3. Confirm that it is more than 200gf•cm at that time.

NOTE

Separate the idler from the reel and confirm the brake torque.

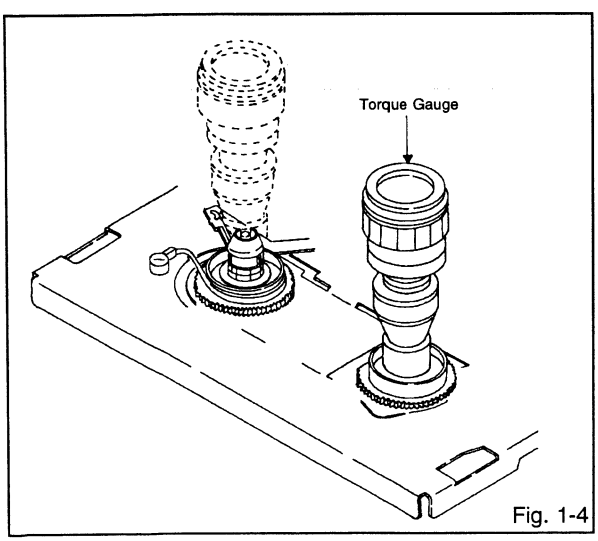


Fig. 1-4

NOTE

If the torque value checked is out of tolerance, replace the appropriate parts as follows.

Check Items	Replace Parts
1-4	Idler Ass'y or Clutch ASS'Y
1-5	Idler Ass'y or Clutch ASS'Y
1-6	Main Brake T Ass'y or Main Brake S Ass'y

2. TAPE RUNNING CONFIRMATION AND ADJUSTMENT

Tape running is adjusted precisely at the factory. Normally, it is not necessary to make adjustments. It is necessary to confirm and make adjustments when the parts of the tape running mechanism are replaced because of extensive usage or failure.

2-1: GUIDE ROLLER

1. Connect CH-1 on the oscilloscope to **TP4102 (PB Envelope)** and CH-2 to **TP4101 (SW Pulse)**.
2. Set the tracking to manual center position in the following way. Press and hold the tracking auto button more than 2 seconds to set the tracking to center position.
3. Trigger with SW pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
4. Adjust the guide roller height while observing the envelope, and make the envelope flat. Adjust the envelope so that the flatness will not be affected even when the tracking control button is pressed. (Use the adjustment screwdriver **JG005**).
5. Press and hold the tracking control button and (at the point that the envelope waveform starts to reduce) adjust the envelope so that the A : B ratio is better than 3 : 2. **(Refer to Fig. 2-1-B)**
6. Adjust the PG shifter **(ELECTRICAL ADJUSTMENT : ITEM 3-1)** in the PLAY mode.

NOTE

After adjustment, confirm and adjust A/C head tilt. **(Refer to item 2-2)**

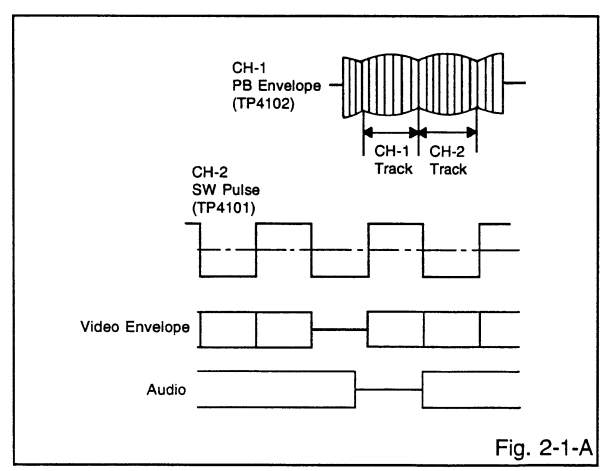


Fig. 2-1-A

MECHANICAL ADJUSTMENTS

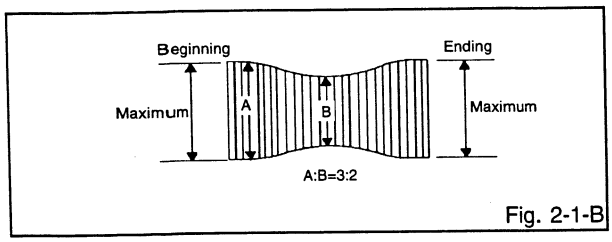


Fig. 2-1-B

2-2: CONFIRMATION AND ADJUSTMENT OF A/C HEAD TILT

When the tape is running abnormally, perform the following adjustments.

1. Insert a new tape and play it back.
2. Confirm that there is no crease on the tape between the P4 post and guide roller (R) and the tape is running smoothly. (It is absolutely impossible to get satisfactory sound if the tape is distorted between the A/C head and P4 post.)
3. If the tape still does not run smoothly, turn the screw Ⓜ and adjust the tilt of the A/C head **(Refer to Fig. 2-2)**

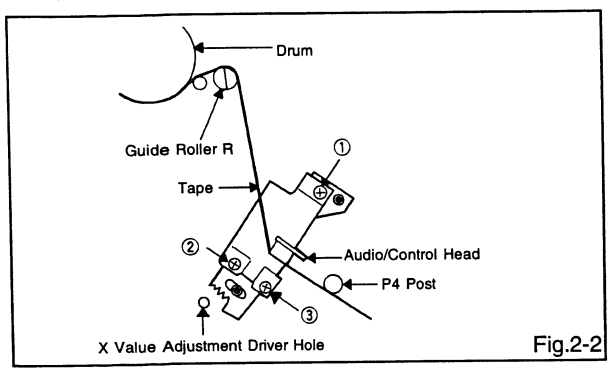


Fig.2-2

2-3: ADJUSTMENT OF A/C HEAD HEIGHT AND AZIMUTH

1. Playback a VHS alignment tape **(JG001E)** and observe the waveform at the audio output terminal.
2. Turn the screw ② slowly to change the azimuth of the A/C head. Adjust the height so that the audio output becomes maximum. **(Refer to Fig. 2-2)**
3. Adjust the screw ③, **(Refer to Fig. 2-2)** until the height of the A/C head reaches the position against the tape as shown in **Fig. 2-3**.
4. When the control head height is not correct. (When you must turn the screw more than 45 degrees), Turn all of the screws ①, ② and ③ to the same degrees. Then confirm the angle of the audio/control head and adjust again.

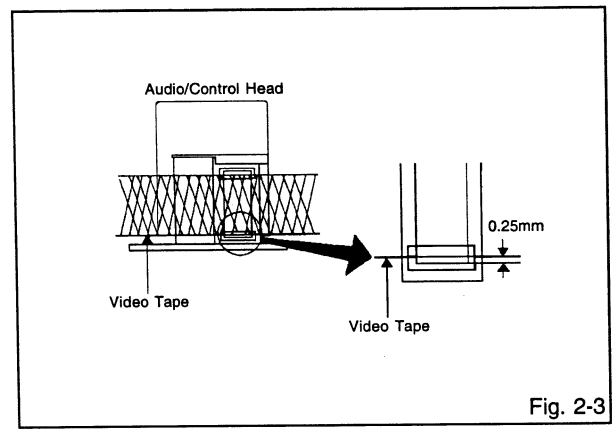


Fig. 2-3

2-4: TAPE RUNNING ADJUSTMENT

1. Adjust the height of reel disk. **(Refer to item 1-1)**
2. Confirm and adjust tension post position. **(Refer to item 1-2)**
3. Adjust the guide roller. **(Refer to item 2-1)**
4. Adjust the A/C head tilt. **(Refer to item 2-2)**
5. Adjust the A/C head height and azimuth. **(Refer to item 2-3)**
6. Connect CH-1 on the oscilloscope to **TP4101** and CH-2 to **TP4102**. Playback the VHS alignment tape **(JG001E)**. Set the tracking to manual center. Adjust X with the screw driver for X **(JG153)** as the **Fig. 2-1-A** and **Fig. 2-1-B** **(Refer to No. 2 of the item 2-1).**

ELECTRICAL ADJUSTMENT

3. ADJUSTMENT PROCEDURE

Read and perform this adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

When replacing IC's or transistors, use only specified silicon grease **(YG6260M).**
(To prevent the damage to IC's and transistors.)

3-1: PG SHIFTER

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape **(JG001E)**

INSTRUCTIONS

1. Playback the alignment tape.**(JG001E)**
2. Press the REC button on the set for more than 3 second. If the indicator ATR disappear's, the adjustment is finished.

(If the above adjustments doesn't work well:)

1. Connect CH-1 on the oscilloscope to **TP4101**and CH-2 to **Pin 19 of J4501**
2. Press the PG AUTO key.**(JG155)**
3. While the ATR indicator is flashing, press the PG MANUAL key. **(JG155)**
4. Adjust the Tracking +/– key until waveform of the oscilloscope measures 6.5± 0.5(H) at both leading and trailing edges. **(Refer to Fig. 3-1-A, B)**
5. Press the Tracking Auto key.

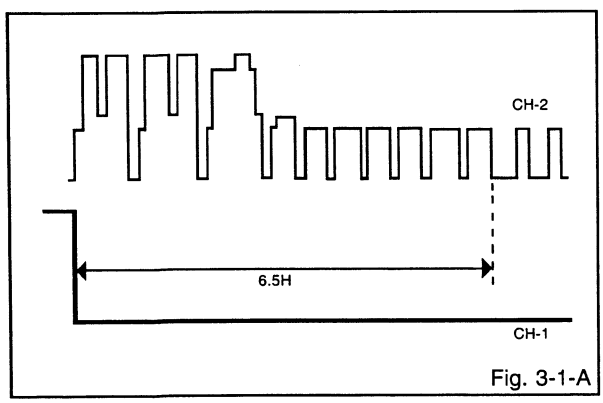


Fig. 3-1-A

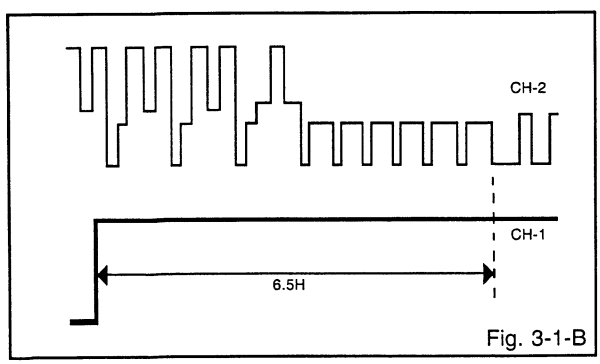
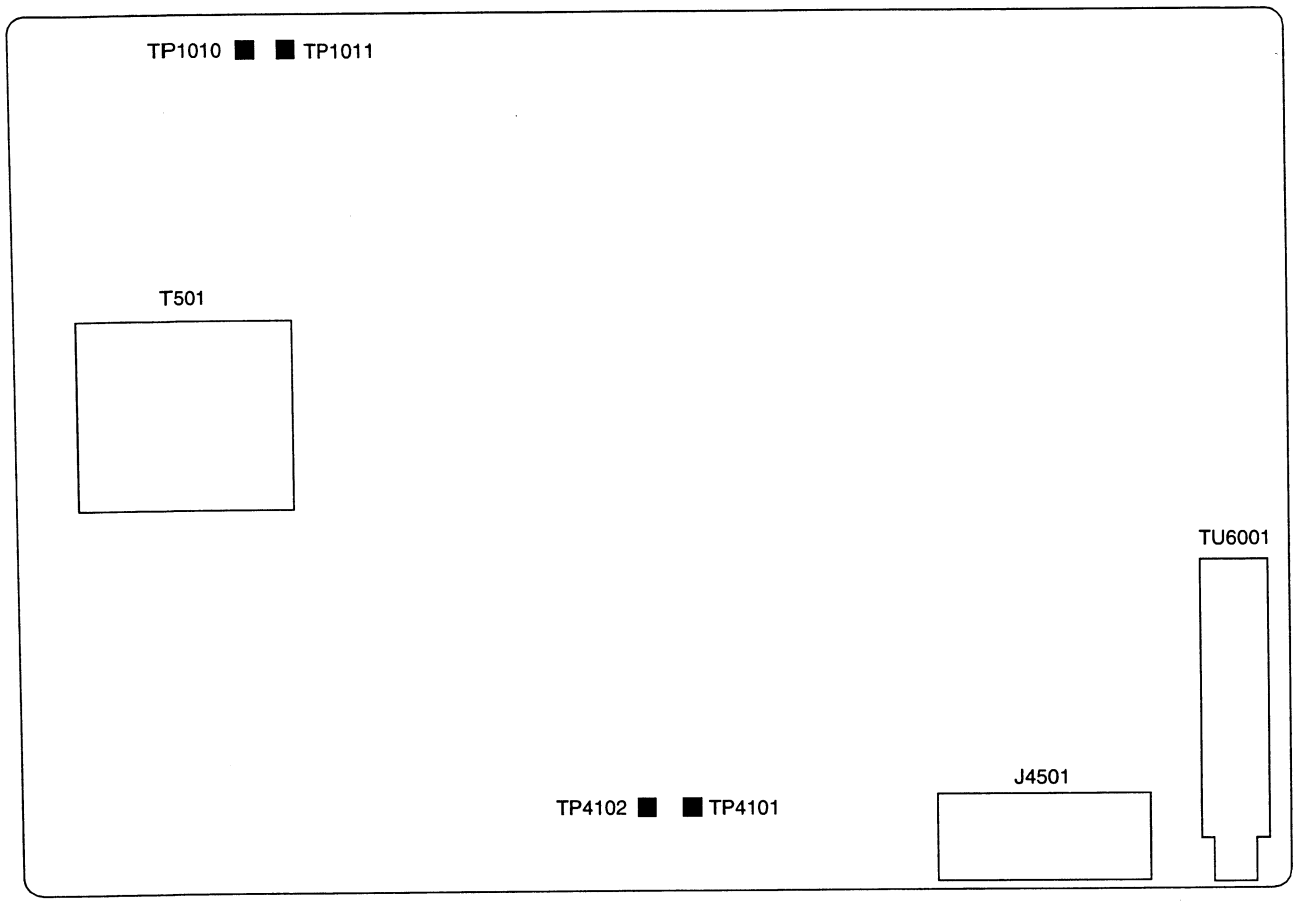


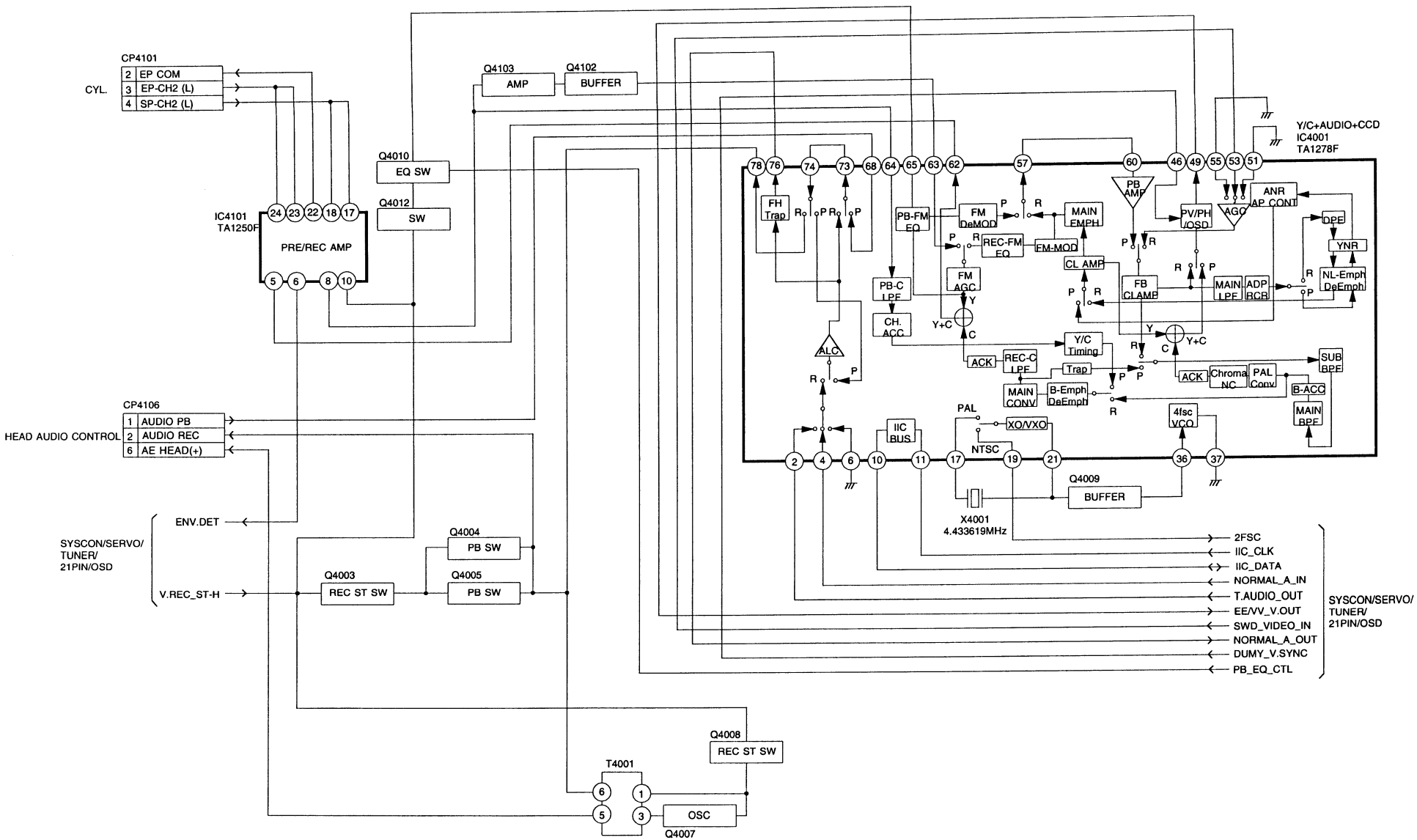
Fig. 3-1-B

MAJOR COMPONENTS LOCATION GUIDE

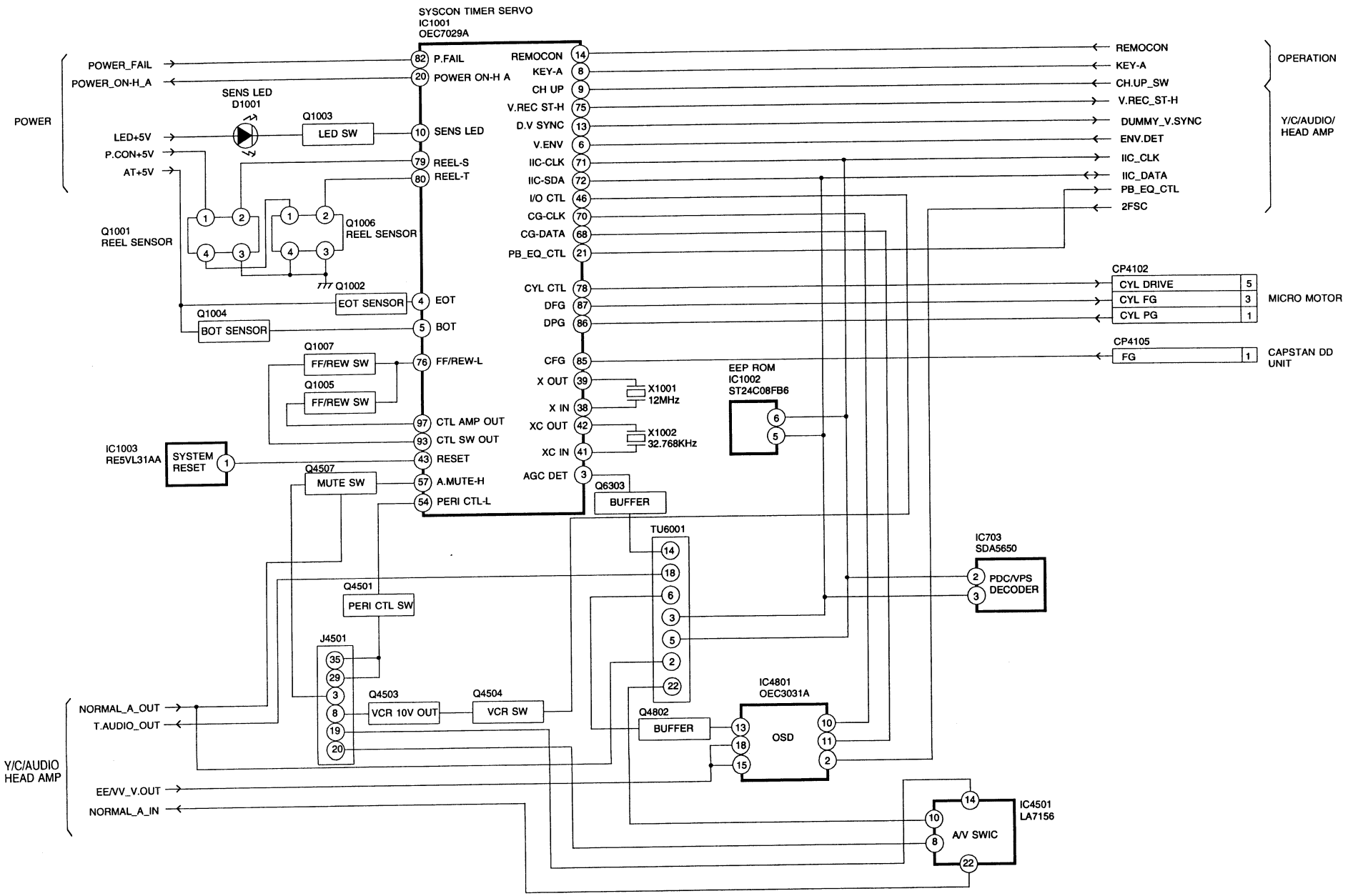


SYSCON

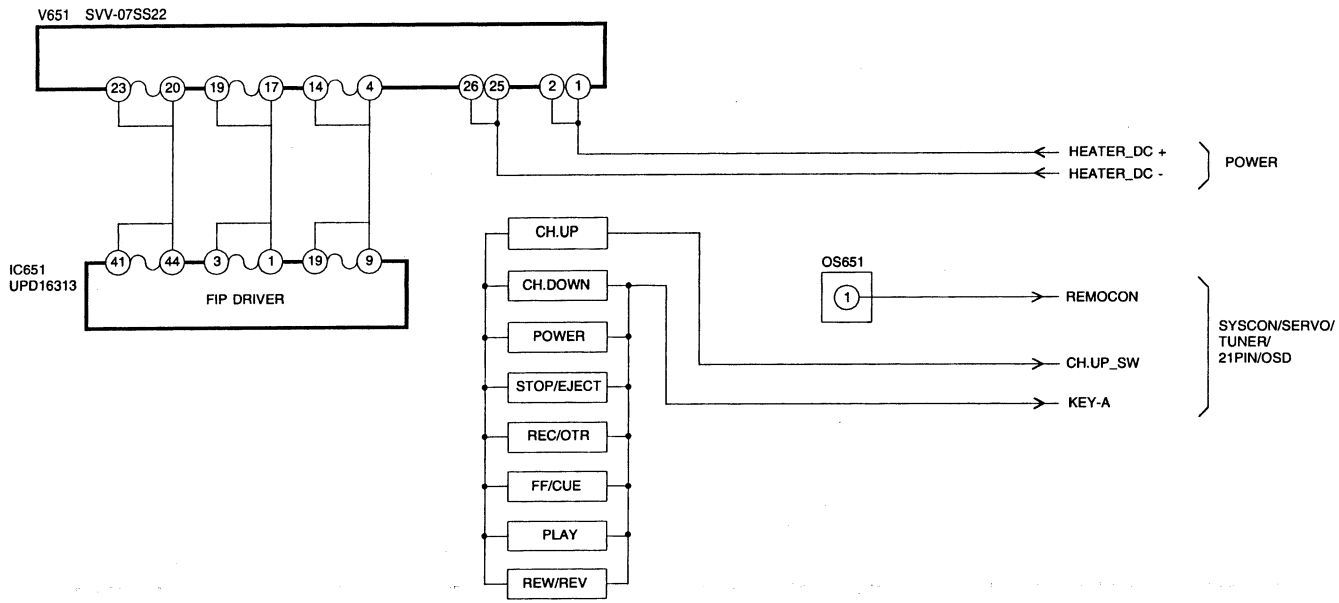
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



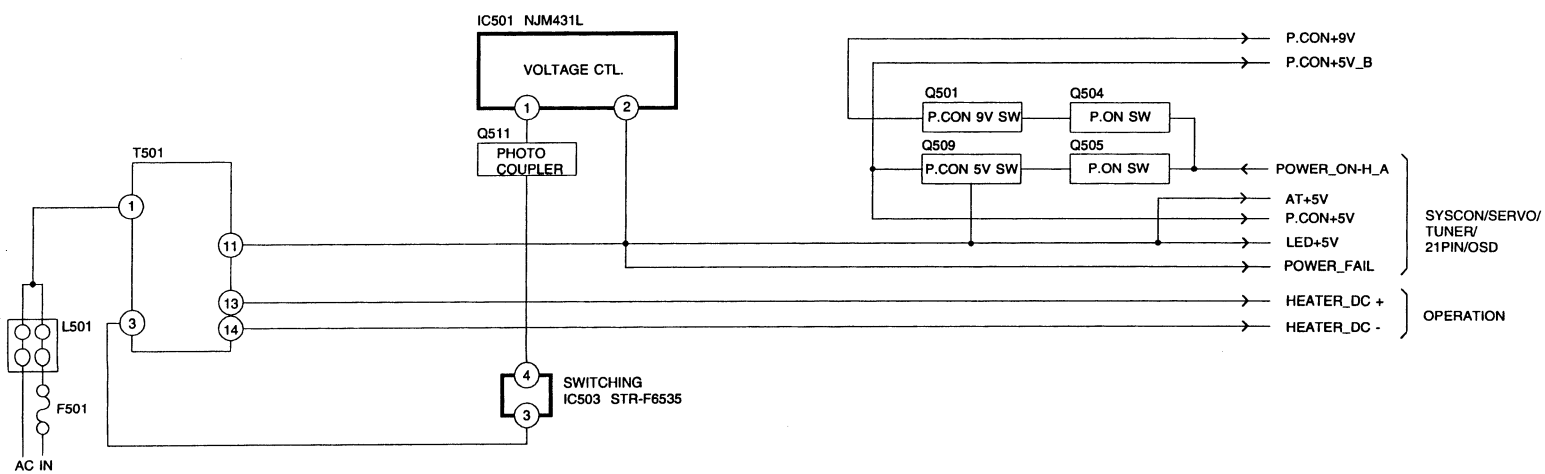
SYSTEM CONTROL/SERVO/TUNER/21PIN/OSD BLOCK DIAGRAM



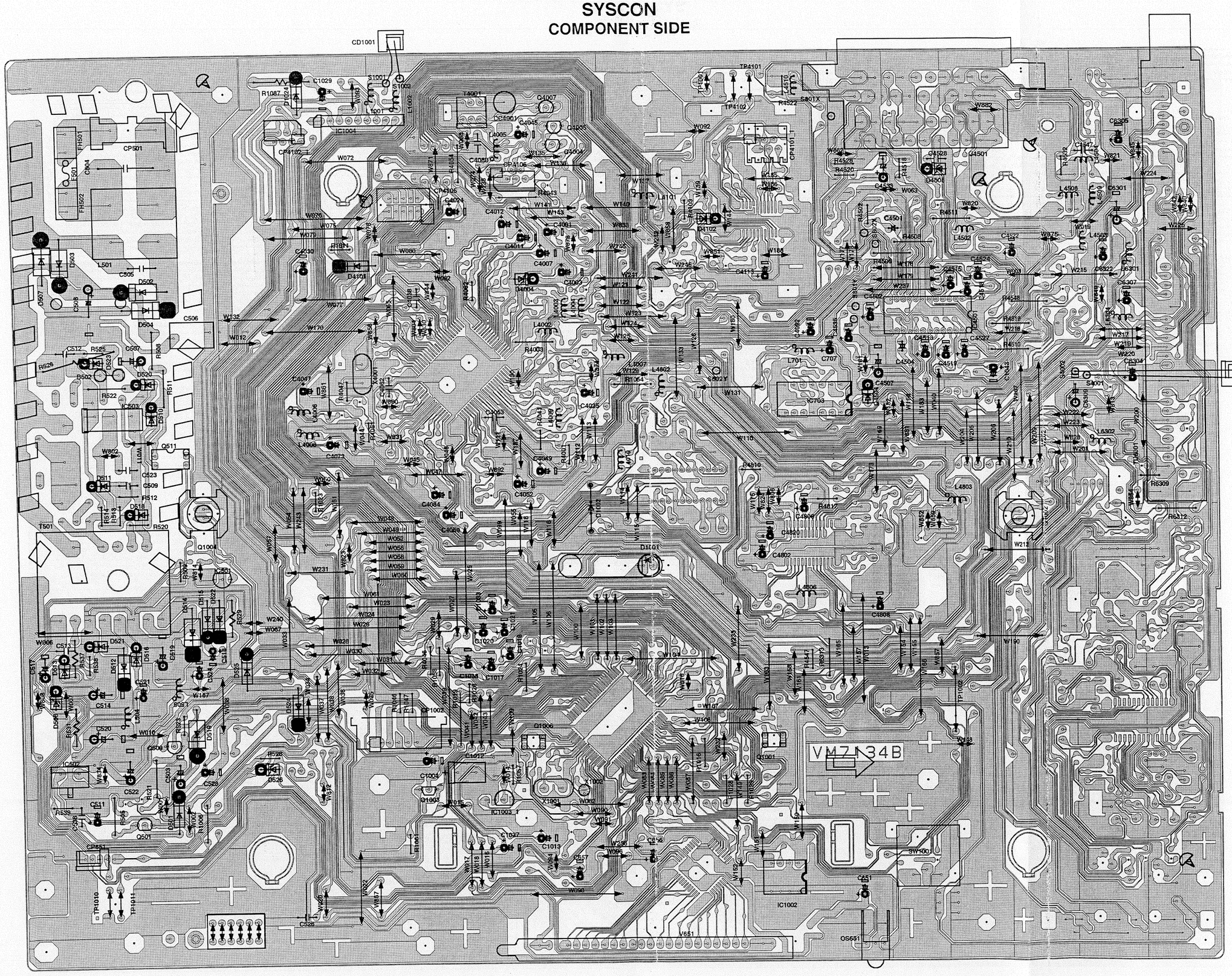
OPERATION BLOCK DIAGRAM



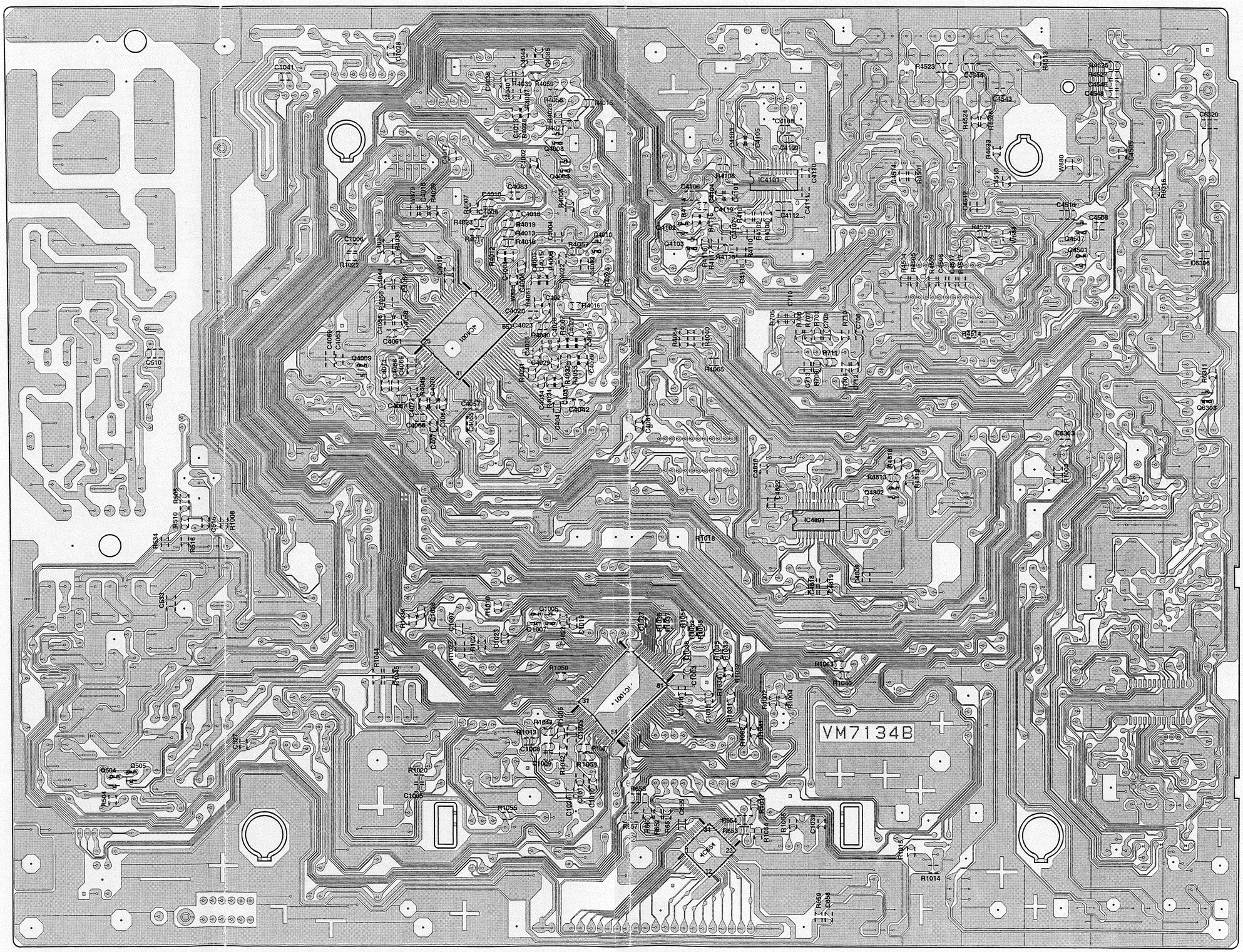
POWER BLOCK DIAGRAM



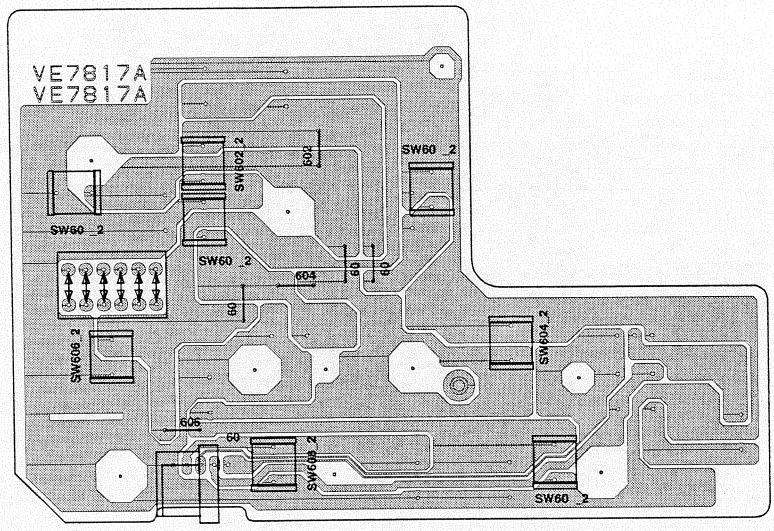
PRINTED CIRCUIT BOARDS
SYSCON
COMPONENT SIDE



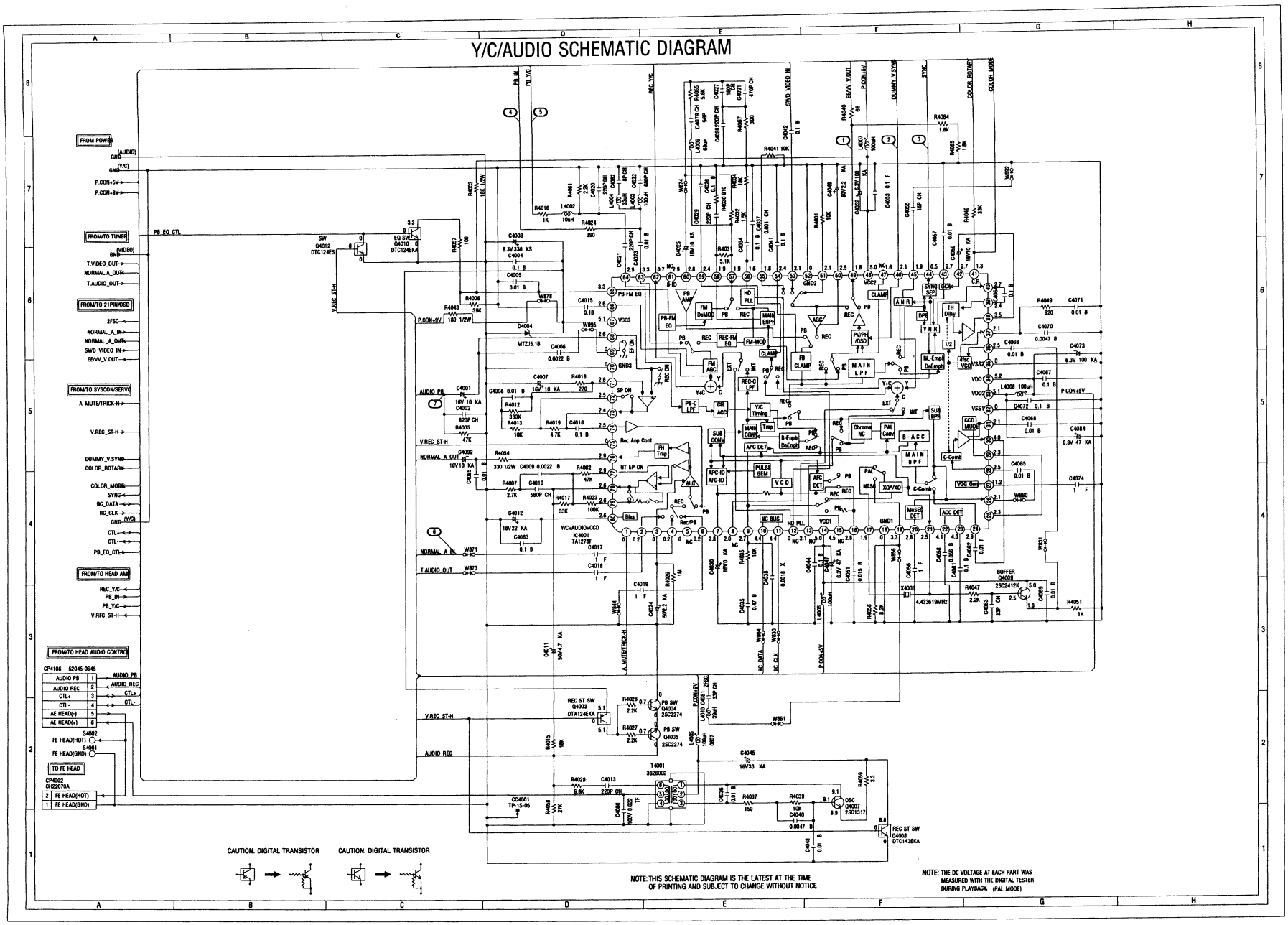
PRINTED CIRCUIT BOARDS
SYSCON
SOLDER SIDE



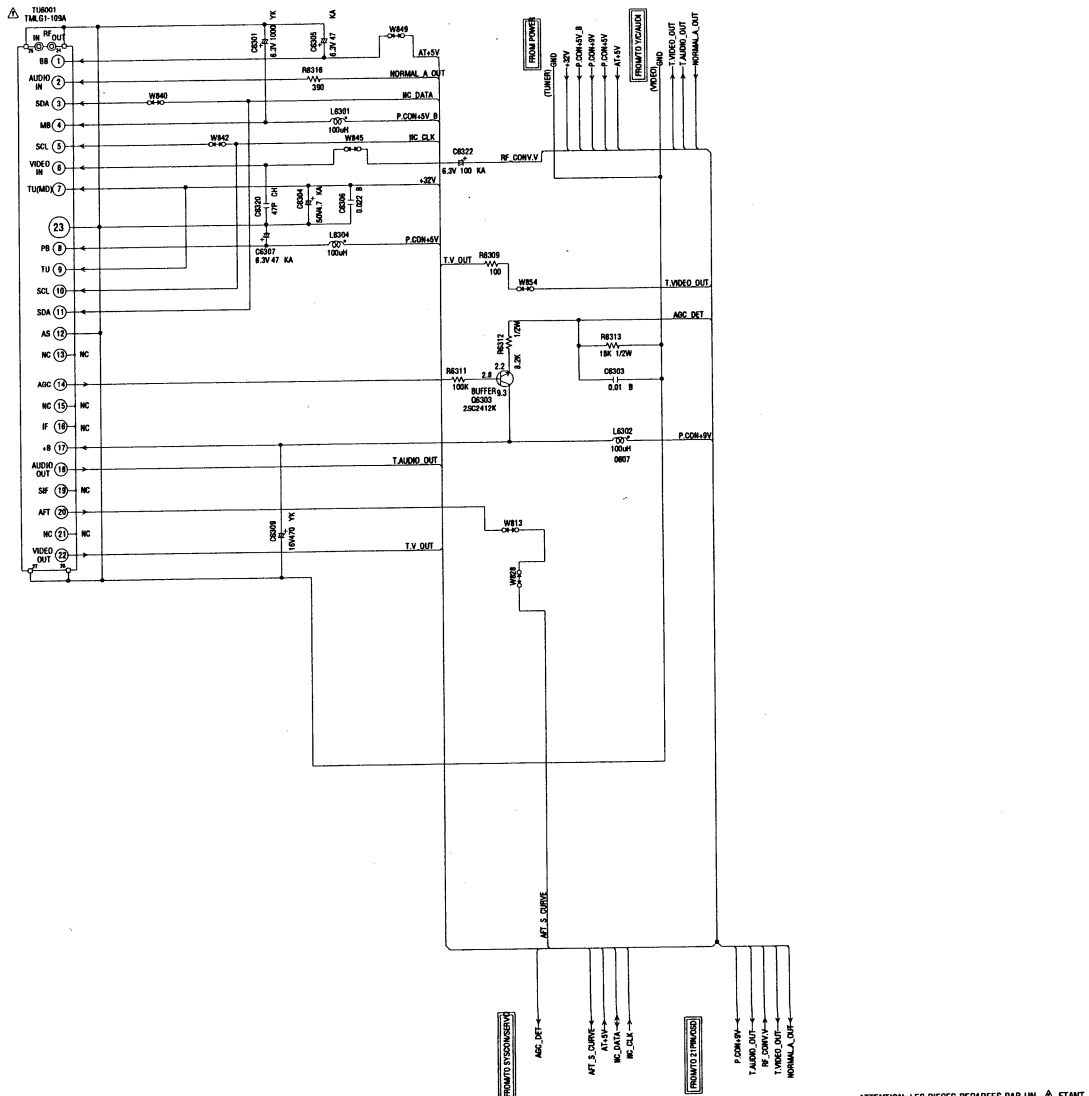
PRINTED CIRCUIT BOARDS
OPERATION



Y/C/AUDIO SCHEMATIC DIAGRAM


FROM POWER
FROM/TO TUNER
FROM/TO 21PIN/OSD
FROM/TO SYSCON/SERVO
FROM/TO HEAD AMP
FROM/TO HEAD AUDIO CONTROL
TO FE HEAD
CP4106 52045-0645
CP4002 CH20701A
S4002
S4001
CAUTION: DIGITAL TRANSISTOR
CAUTION: DIGITAL TRANSISTOR
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK (PAL MODE)

TUNER SCHEMATIC DIAGRAM



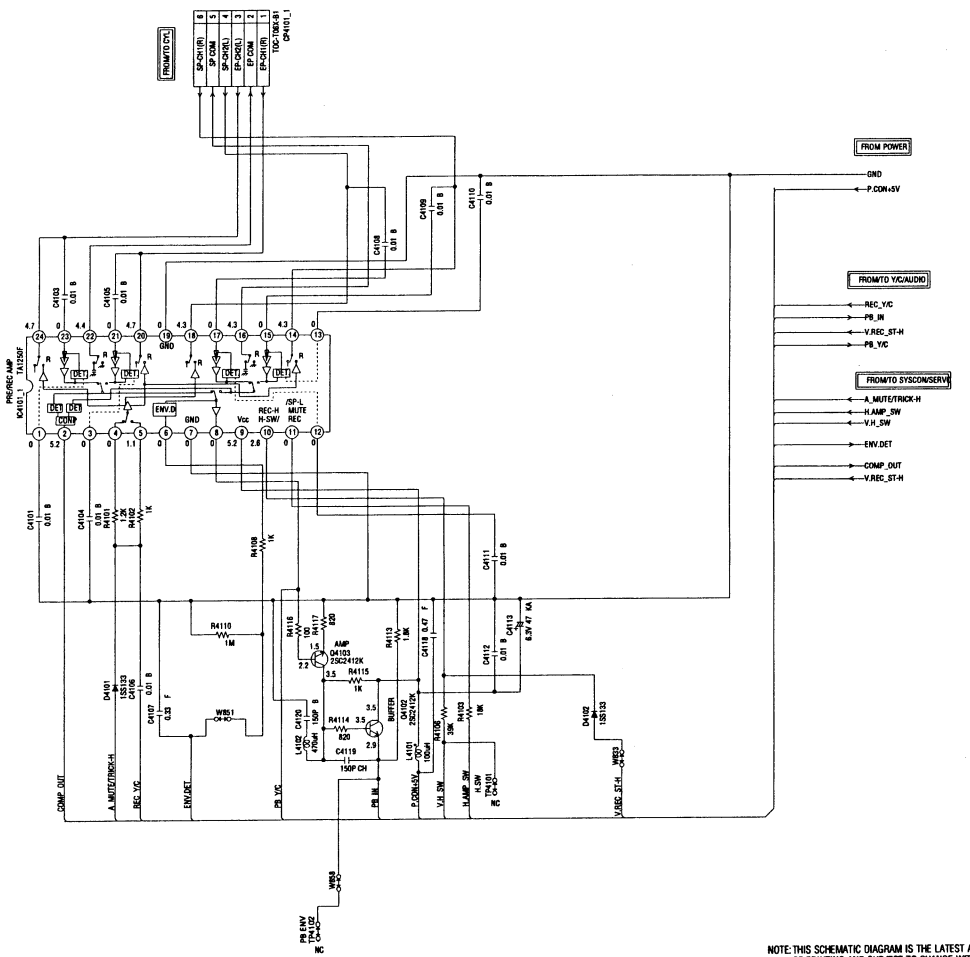
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

HEAD AMP SCHEMATIC DIAGRAM

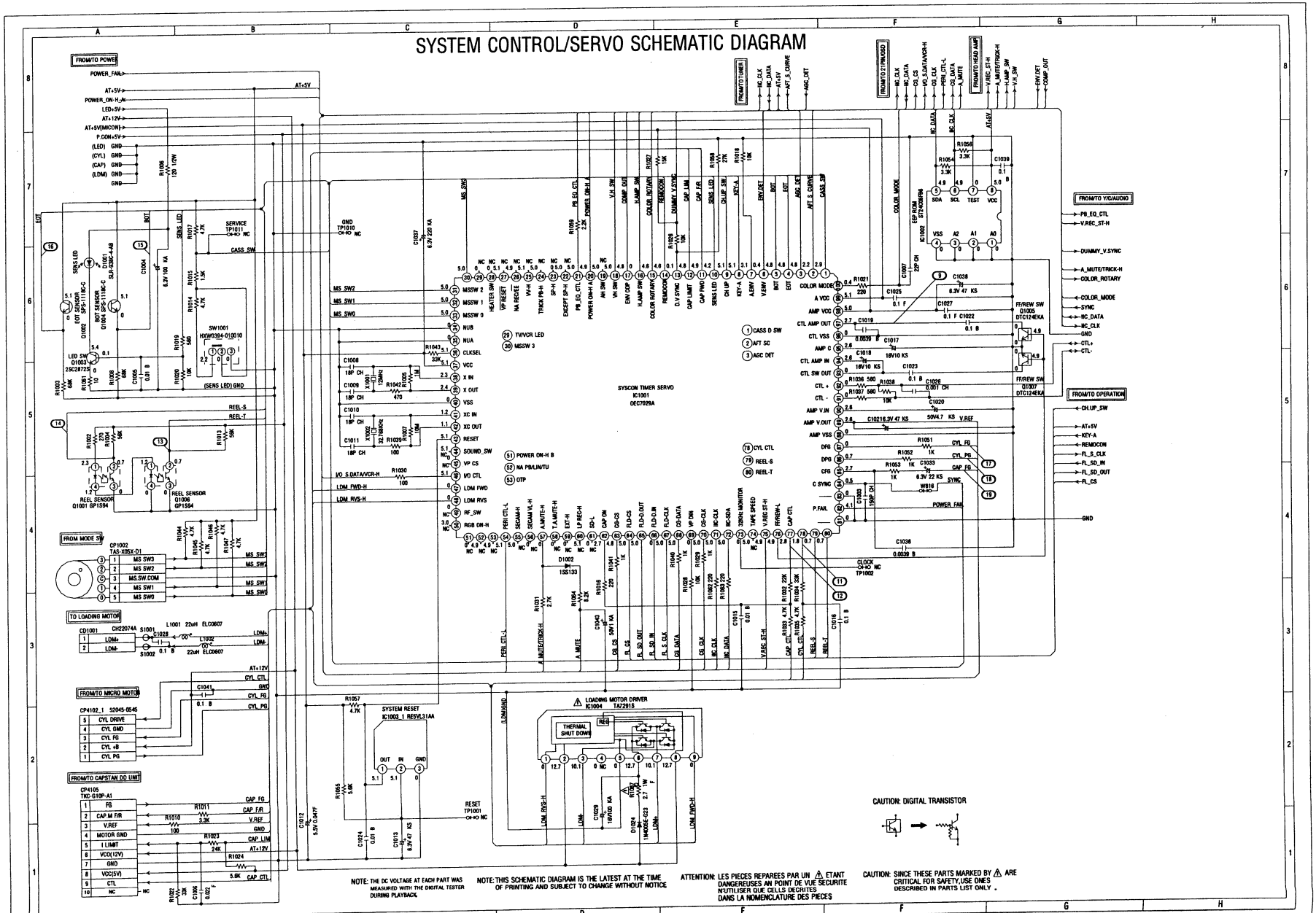


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

PCB010
VM7134

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

SYSTEM CONTROL/SERVO SCHEMATIC DIAGRAM



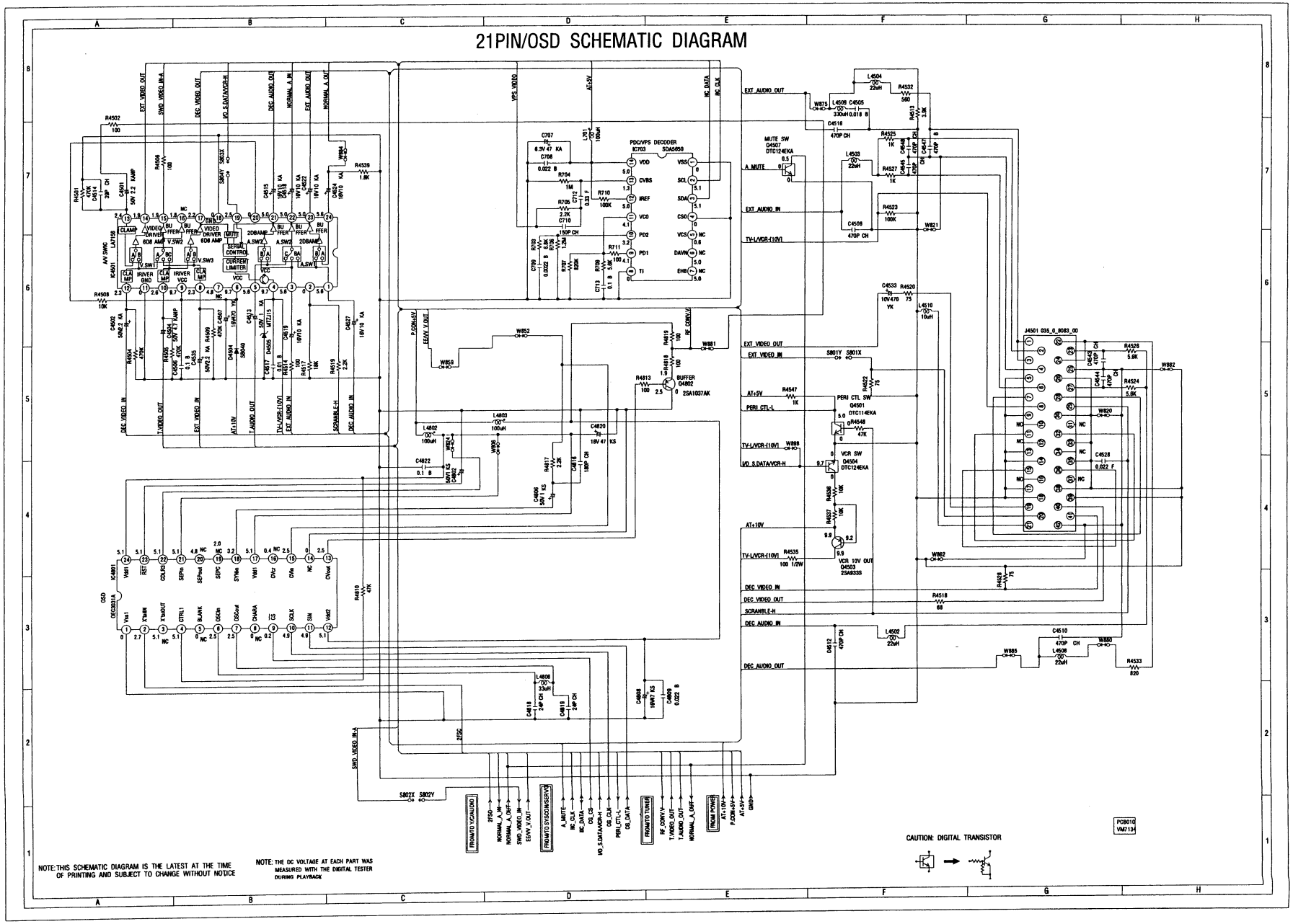
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

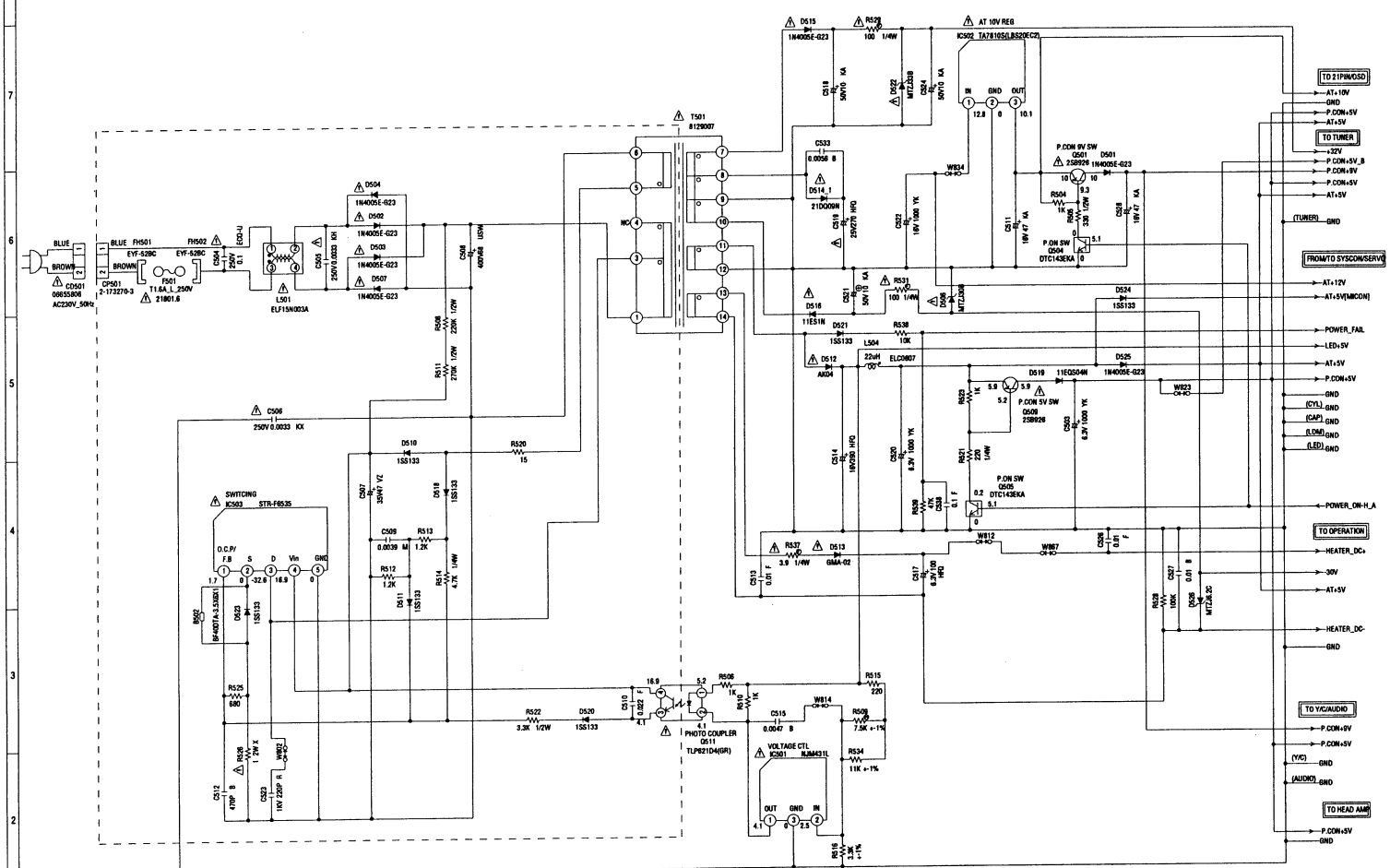
21PIN/OSD SCHEMATIC DIAGRAM



NOTE:THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK

POWER SCHEMATIC DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY.USE ONES DESCRIBED IN PARTS LIST ONLY .

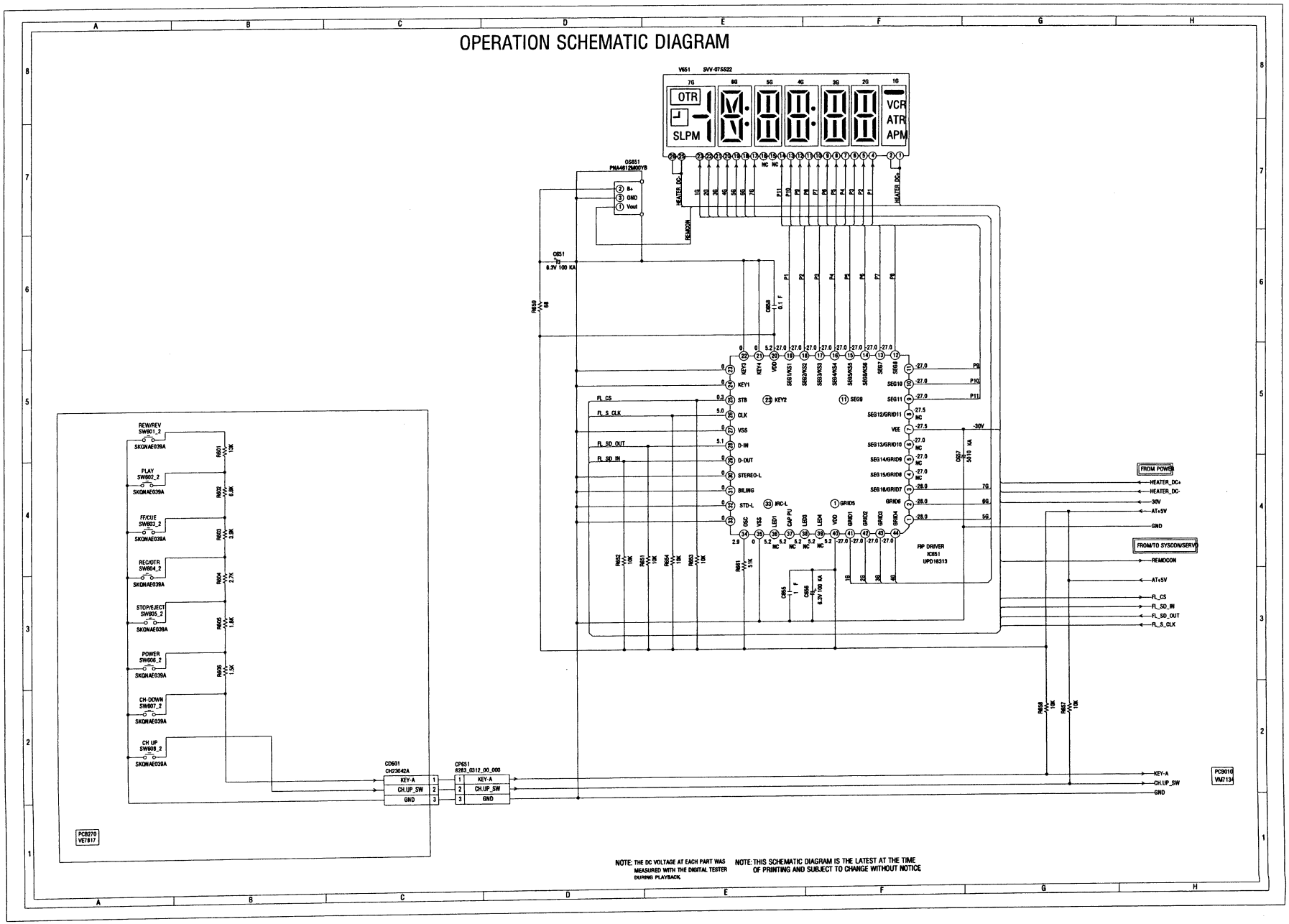
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

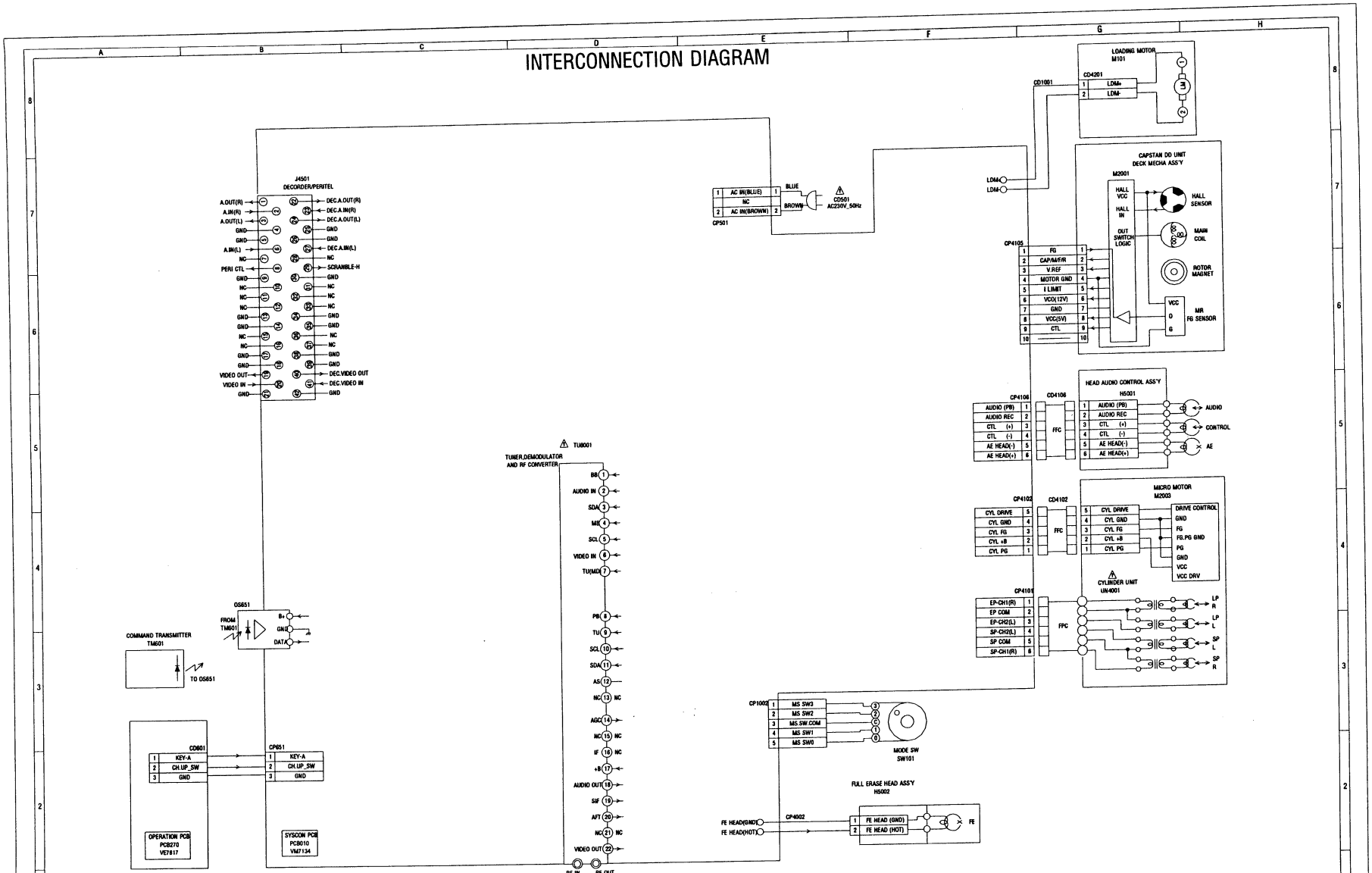
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

CAUTION: DIGITAL TRANSISTOR

OPERATION SCHEMATIC DIAGRAM



INTERCONNECTION DIAGRAM



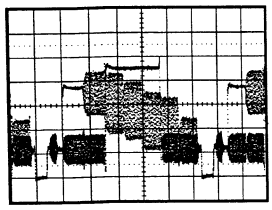
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES

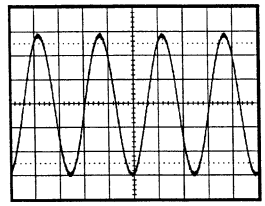
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

WAVEFORMS

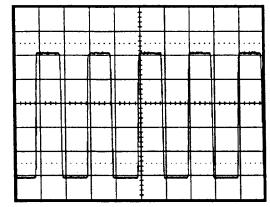
Y/C/AUDIO



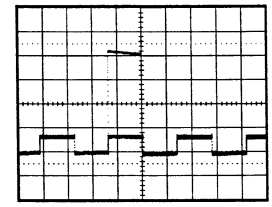
① PB/REC
0.5V 10μs/div



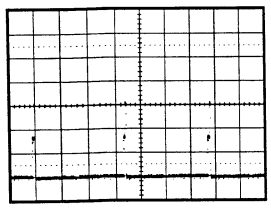
⑥ REC
200mV 0.5ms/div



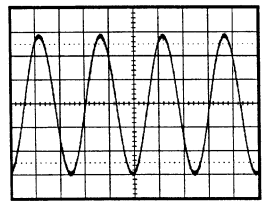
⑬ PB/REC (SP)
1V 0.1s/div



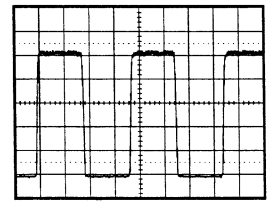
⑱ PB/REC
1V 0.5ms/div



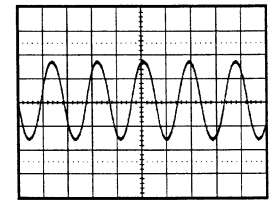
② TRICK PB
1V 5ms/div



⑦ REC
200mV 0.5ms/div

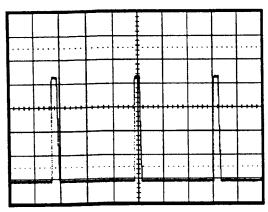


⑭ PB/REC (SP)
1V 0.1s/div

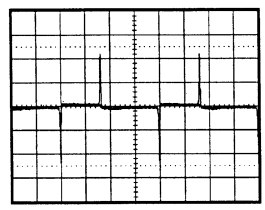


⑲ PB/REC
0.5V 0.5ms/div

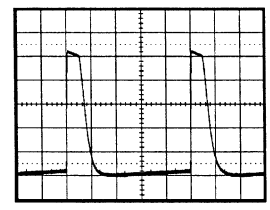
SYSCON/SERVO



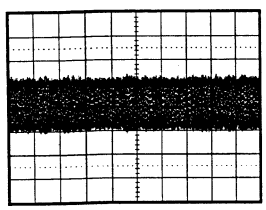
③ PB
1V 20μs/div



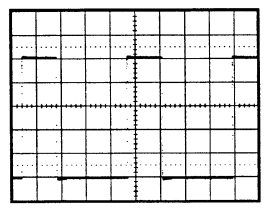
⑨ PB/REC
1V 10ms/div



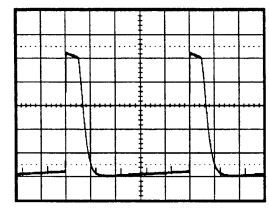
⑮ CASS LESS
1V 2ms/div



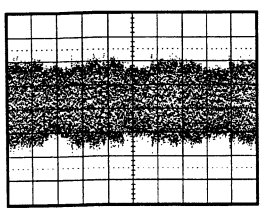
④ PB/REC
200mV 10μs/div



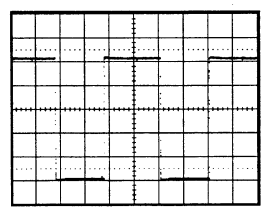
⑪ PB/REC
1V 5μs/div



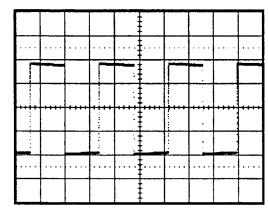
⑯ CASS LESS
1V 2ms/div



⑤ PB
100mV 20μs/div



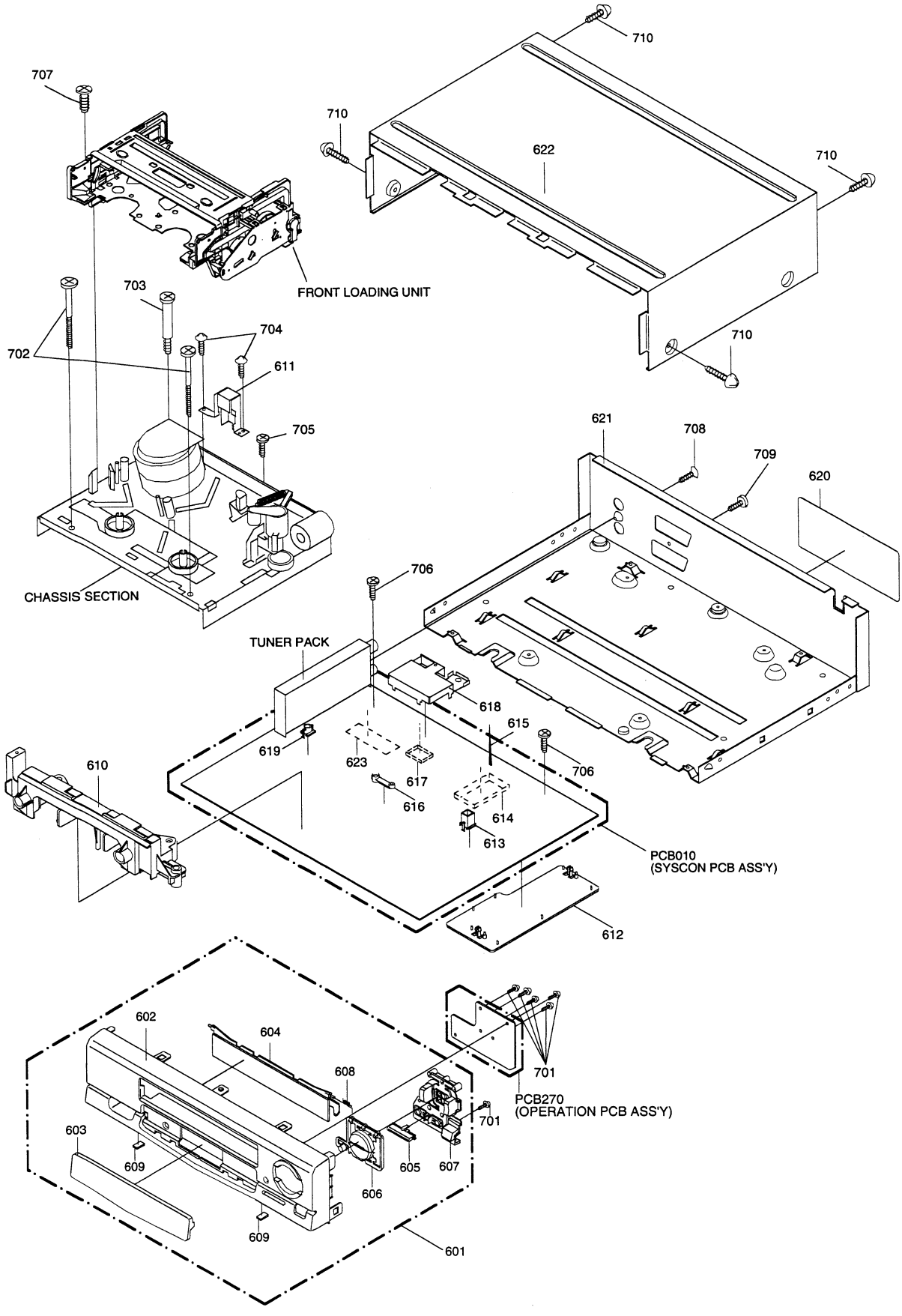
⑫ PB/REC
1V 5μs/div



⑰ PB/REC
1V 0.5ms/div

NOTE : The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

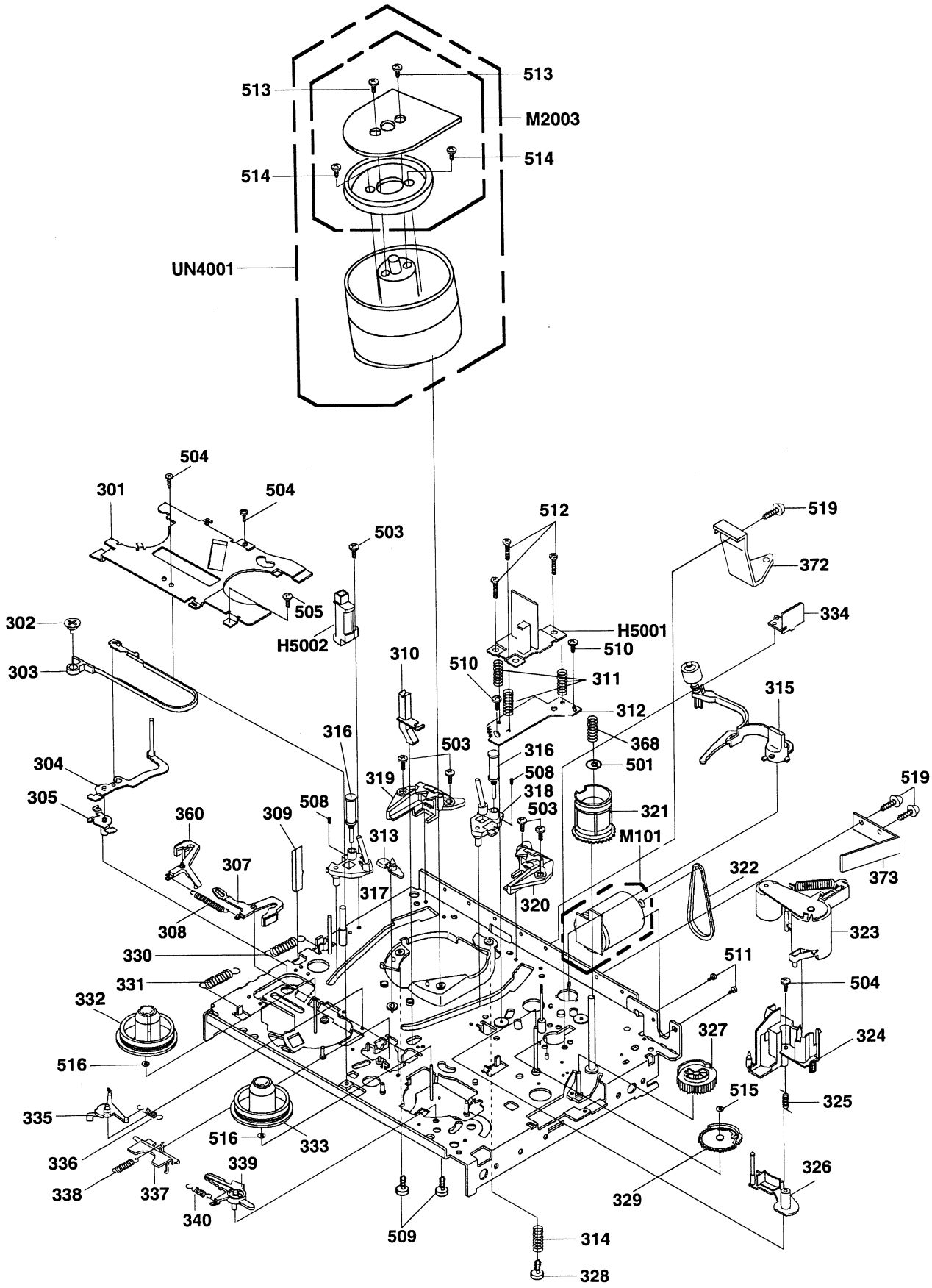
MECHANICAL EXPLODED VIEW



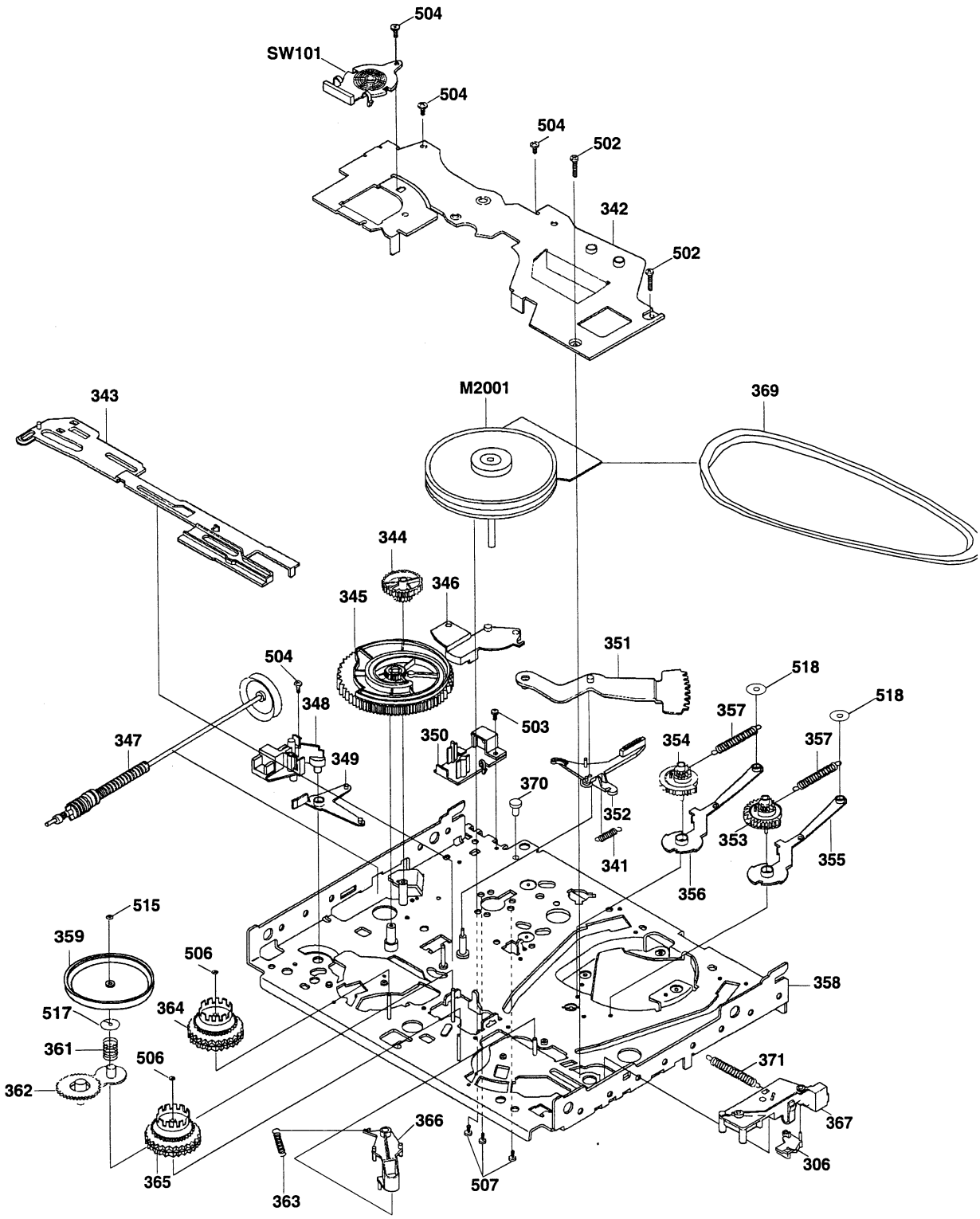
MECHANICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		
601	A4C308B720	CABINET,FRONT ASS'Y		
602	701WPJA292	CABINET,FRONT		
603	711WPAA045	PLATE,DISPLAY		
604	712WPJA169	FLAP		
605	735WPA0344	BUTTON,CHANNEL		
606	735WPDA117	BUTTON,PLAY		
607	735WPDA118	BUTTON,BASE		
608	743WKA0033	SPRING,FLAP		
609	800WFA0001	CUSHION LEG		
610	701WPA0272	HOLDER,DECK		
611	752WSA0130	SHIELD CASE		
612	755WPA0009	PLATE,COVER POWER		
613	754WPAA004	COVER,LED (R)		
614	752WSA0132	SHIELD,AUDIO		
615	-----	COATING CLIP		
616	85OP700031	HOLDER,LED		
617	752WSA0131	SHIELD,COVER HEAD AMP		
618	752WSA0126	SHIELD,CASE HEAD AMP		
619	754WPAA003	COVER,LED(L)		
620	722477A008	SHEET,RATING		
621	702WSA0040	PLATE,BOTTOM		
622	702USS0025	CABINET,TOP		
623	755WNA0005	SHEET,DC		
701	8110226084	SCREW,TAP TITE(P)	BIND	2.6x8
702	8107140C04	TAP TITE(S)	PAN	4x30
703	8146240604	SCREW,TAP TITE(S)	BIND	4x6.4
704	8107630404	SCREW,TAP TITE(S)	BRAZIER	3x4
705	8107240A04	SCREW,TAP TITE(S)	BIND	4x10
706	8107230604	SCREW,TAP TITE(S)	BIND	3x6
707	8110630A04	SCREW,TAP TITE(P)	BRAZIER	3x10
708	8107230404	SCREW,TAP TITE(S)	BIND	3x4
709	8110230604	SCREW,TAP TITE(P)	BIND	3x6
710	8107240802	SCREW,TAP TITE(S)	BIND	4x8
---	791UHA0012	GIFT SHEET		
---	792UHA0100	PACKAGE		
---	793UCDA211	GIFT BOX		
---	JB5X0200	POLYBAG		
---	J4C30801	INSTRUCTION BOOK		
---	J4C30807	QUICK SET-UP SHEET		

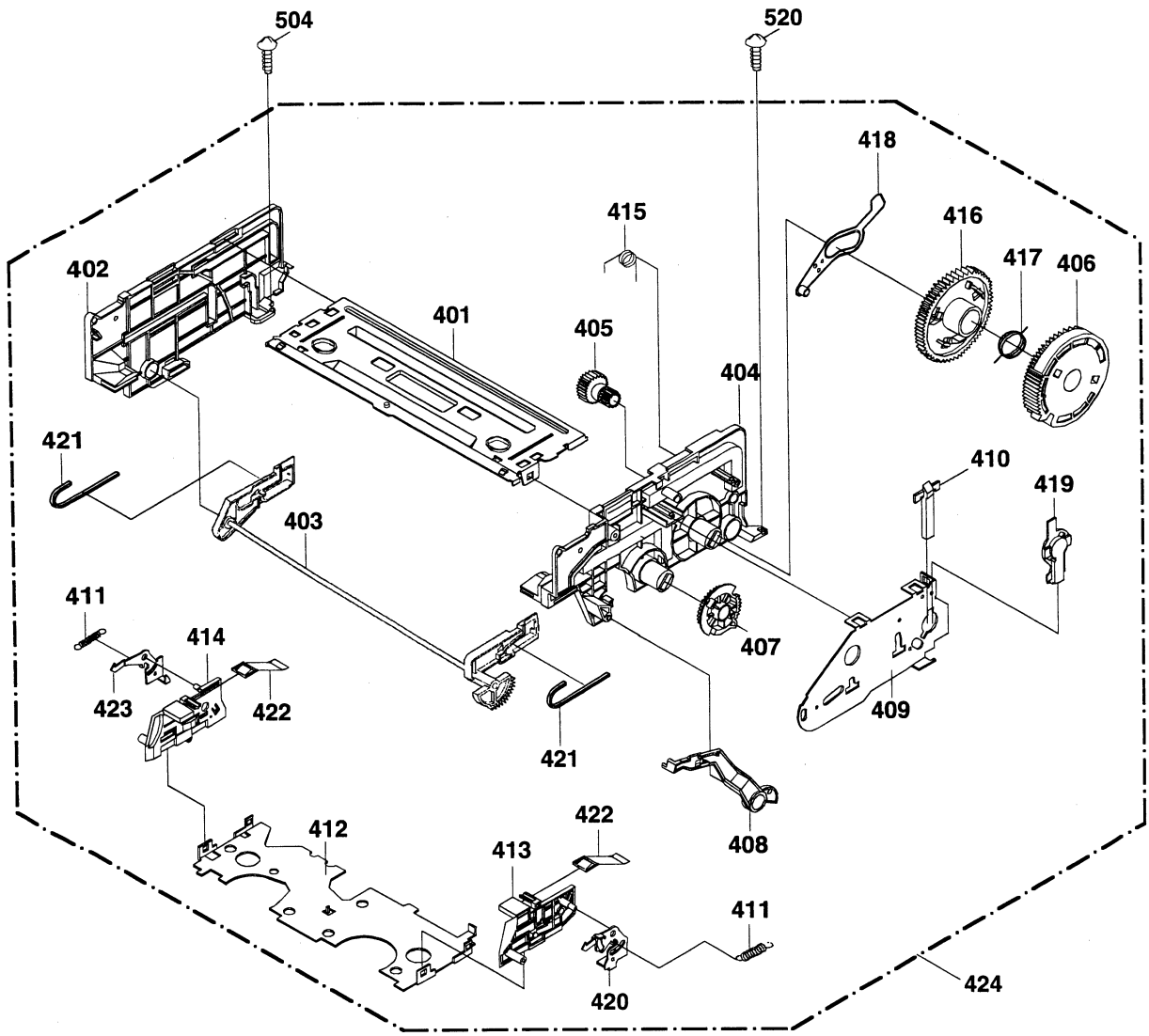
CHASSIS EXPLODED VIEW (TOP VIEW)



CHASSIS EXPLODED VIEW (BOTTOM VIEW)



FRONT LOADING UNIT EXPLODED VIEW



CHASSIS/FRONT LOADING UNIT REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
# 301	85OP600471	BRACKET,BRAKE
302	85OP400358	ADJUST,TENSION
303	85OA400122	TENSION BAND ASS'Y
304	85OA400124	TENSION ARM ASS'Y
305	85OA400123	TENSION LEVER 2 ASS'Y
306	85OP600536	STOPPER,TENSION
# 307	85OA600156	MAIN BRAKE,T ASS'Y
# 308	85OP800252	SPRING,MAIN BRAKE
309	85OP900564	REFLECTOR,EOT
310	85OP400434	REFLECTOR,LED 2
311	85OP800315	SPRING,AC HEAD 2
312	85OP500060	BASE,AC HEAD
313	85OP000394	POST,CASS GUIDE L
314	85OP800245	SPRING,AZIMUTH 2
# 315	85OA500020	AHC ASS'Y(2)
316	85OA400102	GUIDE ROLLER ASS'Y
317	85OA400161	BASE,S INCLINED ASS'Y
318	85OA400162	BASE,T INCLINED ASS'Y
319	85OP400439	CATCHER,S
320	85OP400440	CATCHER,T
# 321	85OP400430	CAM,PINCH ROLLER (PB)
322	85OP600487	BELT,LOADING
# 323	85OA400157	PINCH ROLLER (PB) BLOCK
324	85OP900541	CASS,OPENER
325	85OP800264	SPRING,P5
# 326	85OA400168	P5 ARM ASS'Y(PB)
327	85OP400342	CAM,GEAR
328	8146230A14	JOINT SCREW BIND M3x11
# 329	85OP400450	CAM,P5
330	85OP400356	SPRING,TENSION ARM 2
# 331	85OP800311	SPRING,TENSION ARM(1S)
332	85OP200216	REEL S
333	85OP200217	REEL T
# 334	85OP400446	CATCHER,P5 (VP)
335	85OP600465	SUB BRAKE,S
336	85OP800253	SPRING,S-S BRAKE
337	85OP200247	ARM.JOINT
338	85OP800262	SPRING,JOINT ARM
339	85OA600157	SUB BRAKE T ASS'Y
340	85OP800254	SPRING,T-S BRAKE
341	85OP800255	SPRING,CAP BRAKE
342	85OP600485	PLATE,BOTTOM
# 343	85OA600181	ROD MAIN(S)ASS'Y
344	85OP400341	GEAR,MIDDLE
# 345	85OP600535	CAM,MAIN
# 346	85OP600468	LEVER,MAIN BRAKE
# 347	85OA600159	WORM ASS'Y
348	85OP600483	BRACKET,WORM F
349	85OP600474	LEVER,RATCHET
350	85OP600484	BRACKET,WORM R
351	85OP300151	LEVER,LOADING
352	85OA600174	CAPSTAN BRAKE ASS'Y (M.J)
353	85OP300152	GEAR,LOADING S
354	85OP300153	GEAR,LOADING T
355	85OA300053	LOADING ARM S ASS'Y
356	85OA300054	LOADING ARM T ASS'Y
357	85OP800263	SPRING,LOADING GEAR
# 358	85OA000226	MAINCHASSIS ASS'Y
359	85OP200213	CENTER,PULLEY
360	85OA600155	MAIN BRAKE,S ASS'Y
361	85OP800261	SPRING,C-PULLEY
# 362	85OA200065	ARM IDLER ASS'Y
363	85OP800270	SPRING,LEVER TENSION
# 364	85OA200064	CLUTCH GEAR T ASS'Y
# 365	85OA200070	CLUTCH GEAR S(S)ASS'Y
366	85OP400360	LEVER,TENSION
# 367	85OP400452	HOLDER,TENSION(S)
368	85OP800310	SPRING,CAM PINCH
369	85OP200215	BELT,CAPSTAN
370	85OP000443	SPACER,CAPSTAN
371	85OP800256	SPRING,MAIN ROD
372	761WSA0044	ANGLE,DECK BACK
373	762WSA0039	ANGLE,DECK

REF. NO.	PART NO.	DESCRIPTION	
401	85OP900674	BRACKET,TOP(2)	
402	85OP900675	BRACKET,SIDE L	
403	85OA900165	LINK ASSY	
404	85OP900615	BRACKET,SIDE R	
405	85OP900601	GEAR,JOINT	
406	85OP900602	GEAR,CAM	
407	85OP900609	GEAR,LINK R	
408	85OP900672	LEVER,FLAP 2	
409	85OP900616	BRACKET,SIDE R2	
410	85OP900621	REFLECTOR,BOT	
411	85OP800296	SPRING,LOCKER	
412	85OP900611	CASS,HOLDER	
413	85OP900613	CASS,SIDE R	
414	85OP900668	CASS,SIDE L	
415	85OP800298	SPRING,BRACKET R	
416	85OP900608	GEAR,CLUTCH	
417	85OP800297	SPRING,CLUTCH	
418	85OP900610	LEVER,BOT	
419	85OP900620	COVER,SENSOR BOT	
420	85OP900606	LOCKER,R	
421	85OP800294	SPRING,LINK	
422	85OP800299	SPRING,PACK	
423	85OP900605	LOCKER,L	
424	85OA900206	FRONT LOADING UNIT 14	
501	82Q4070C5N	POLYSLIDER WASHER	4.1x7.0xT0.25
502	8109226A64	SCREW,TAP TITE(B) BIND	2.6x16
503	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
504	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
505	8107123604	SCREW,TAP TITE(S) PAN	2.3x6
506	82P166005N	POLYSLIDER WASHER(CUT)	1.6x6.0xT0.5
507	8109126804	SCREW,TAP TITE(B)PAN	2.6x8
508	815DJ20302	SET SCREW 6 CUP POINT	M2x3
509	810A130604	SCREW/WASHER(A)	M3x6
510	810B126604	SCREW/WASHER(B)	M2.6x6.0
511	8102130304	SCREW,PAN	M3.0x3.0
512	8102126A04	SCREW,PAN	M2.6x10
513	810A123504	SEMS A	M2.3x5.0
514	85OPAA0197	SCREW,MOTOR	M3x5
515	82P266005N	POLYSLIDER WASHER(CUT)	2.6x6.0xT0.5
516	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
517	82P26A005N	POLYSLIDER WASHER(CUT)	2.6x10xT0.5
518	83CST40000	CS-RING	4.0
519	8107230604	SCREW,TAP TITE(S) BIND	3x6
520	8107126805	SCREW,TAP TITE(S) PAN	2.6x8
H5001	1523D91032	HEAD (AUDIO CONTROL)	HVMXA1031A
H5002	1543D02010	HEAD,FULL ERASE	HVFHF0059A
M101	85OA600177	LOADING MTR.ASS'Y	
M2001	1510398029	CAPSTAN DD UNIT	F2QTB32
M2003	1589V11005	MICRO MOTOR	EP14BB
# SW101	0520244006	MODE SWITCH	SRZZ0B068C
⚠ UN4001	A4C301B500	CYLINDER UNIT ASS'Y	A4C301B500

Note: Some parts labeled # are not compatible, but they are very similar before servicing, be sure to check the parts in the INFORMATION FOR USING THE DECK PARTS (OVD-5) for the repair. Because if you use wrong parts, the deck or tape will be damaged.

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
RESISTORS			
⚠ R526	R3118A010J	R, METAL OXIDE	1 OHM 2W
⚠ R529	R635841O1J	R, FUSE	100 OHM 1/4W
⚠ R531	R61584101J	R, FUSE	100 OHM 1/4W
⚠ R537	R635843R9J	R, FUSE	3.9 OHM 1/4W
⚠ R1087	R635812R7J	R, FUSE	2.7 OHM 1W
R4535	R002T21O1J	RC	100 OHM 1/2W
CAPACITORS			
⚠ C504	P2162B104M	CMP	0.1 UF 250V AC
⚠ C505	CB3LE0ML3M	CC	0.0033UF 250V
⚠ C506	CB3930ML3M	CC	0.0033UF 250V
C508	E02TFH680M	CE	68 UF 400V
⚠ C519	E01QT3271M	CE	270 UF 25V
C523	C0300R6H2K	CC	220 PF 1KV B
C4120	CHG0B04E2K	CC	150 PF 50V B
DIODES			
D501	D2LXE65800	DIODE, SILICON	1N4005E-G23
⚠ D502	D2LXE65800	DIODE, SILICON	1N4005E-G23
⚠ D503	D2LXE65800	DIODE, SILICON	1N4005E-G23
⚠ D504	D2LXE65800	DIODE, SILICON	1N4005E-G23
⚠ D506	D97U030O1B	DIODE, ZENER	MTZJ30B T-77
⚠ D507	D2LXE65800	DIODE, SILICON	1N4005E-G23
D510	D1VT001330	DIODE, SILICON	1SS133T-77
D511	D1VT001330	DIODE, SILICON	1SS133T-77
⚠ D512	D2BT0AK040	DIODE, SCHOTTKY BARRIER	AK04V0
⚠ D513	D13TGMA020	DIODE, SILICON	GMA-02-BT
⚠ D514	D28T21DQN9	DIODE, SCHOTTKY	21DQ09N-TA2B1
⚠ D515	D2LXE65800	DIODE, SILICON	1N4005E-G23
⚠ D516	D28T11ESN1	DIODE, SILICON	11ES1N-TA1B2
D518	D1VT001330	DIODE, SILICON	1SS133T-77
D519	D28XQS04N0	DIODE, SCHOTTKY	11EQS04N-TA2B5
D520	D1VT001330	DIODE, SILICON	1SS133T-77
D521	D1VT001330	DIODE, SILICON	1SS133T-77
⚠ D522	D97U03301B	DIODE, ZENER	MTZJ33B T-77
D523	D1VT001330	DIODE, SILICON	1SS133T-77
D524	D1VT001330	DIODE, SILICON	1SS133T-77
D525	D2LXE65800	DIODE, SILICON	1N4005E-G23
D526	D97U06R21C	DIODE, ZENER	MTZJ6.2C T-77
D1001	0001300030	LED	SLR-938C-4-AB
D1002	D17X001330	DIODE, SILICON	1SS133T-72
D1024	D2LXE65800	DIODE, SILICON	1N4005E-G23
D4004	D97U05R11B	DIODE, ZENER	MTZJ5.1B T-77
D4101	D1VT001330	DIODE, SILICON	1SS133T-77
D4102	D1VT001330	DIODE, SILICON	1SS133T-77
D4504	D23TSB0400	DIODE, SILICON	SB040-G3 or
	D28TQS04N0	DIODE, SCHOTTKY	11EQS04N-TA1B2
D4505	D97U015010	DIODE, ZENER	MTZJ15 T-77
ICS			
⚠ IC501	I0Q90431L0	IC	NJM431L
⚠ IC502	I05TA7810S	IC	TA7810S(LBS20EC2)
⚠ IC503	I0BT065350	IC	STR-F6535
IC651	I0XF516313	IC	UPD16313
IC703	I3ED656500	IC	SDA5650
IC1001	I56F57029A	IC	OEC7029A
IC1002	I53D08FB60	IC	ST24C08FB6 or
	ICBD4C08N0	IC	NM24C08N
IC1003	IE1J031AA0	IC	RE5VL31AA-TZC
⚠ IC1004	I05S07291S	IC	TA7291S
IC4001	I05F01278F	IC	TA1278F
IC4101	ID5F1250F0	IC	TA1250F
IC4501	I03D071560	IC	LA7156
IC4801	I53F3031A0	IC	OEC3031A
TRANSISTORS			
⚠ Q501	TBWT009260	TRANSISTOR, SILICON	2SB926(S,T)-AA
Q504	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
Q505	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
⚠ Q509	TBWT009260	TRANSISTOR, SILICON	2SB926(S,T)-AA
⚠ Q511	0002500480	PHOTO COUPLER	TLP621D4(GR)
Q1001	0002G00490	PHOTO COUPLER	GP1S94
Q1002	0000300340	TRANSISTOR, PHOTO	SPS-1118C-C-T1
Q1003	TCYT2872S0	TRANSISTOR, SILICON	2SC2872S
Q1004	0000300340	TRANSISTOR, PHOTO	SPS-1118C-C-T1
Q1005	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q1006	0002G00490	PHOTO COUPLER	GP1S94
Q1007	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q4003	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146
Q4004	TCWT022740	TRANSISTOR, SILICON	2SC2274(E,F)-AA
Q4005	TCWT022740	TRANSISTOR, SILICON	2SC2274(E,F)-AA

REF. NO.	PART NO.	DESCRIPTION	
TRANSISTORS			
Q4007	TCKT013170	TRANSISTOR, SILICON	2SC1317(Q,R,S)-T
Q4008	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
Q4009	T8YJ2412K0	TRANSISTOR, SILICON	2SC2412KT146(R,S)
Q4010	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q4012	TNYTC03001	COMPOUND TRANSISTOR	DTC124ESTP
Q4102	T8YJ2412K0	TRANSISTOR, SILICON	2SC2412KT146(R,S)
Q4103	T8YJ2412K0	TRANSISTOR, SILICON	2SC2412KT146(R,S)
Q4501	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146
Q4503	TAYT0933S0	TRANSISTOR, SILICON	2SA933STP(R,S)
Q4504	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q4507	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q4802	T6YJ1037K0	TRANSISTOR, SILICON	2SA1037AKT146(R,S)
Q6303	T8YJ2412K0	TRANSISTOR, SILICON	2SC2412KT146(R,S)
COILS &TRANSFORMERS			
⚠ L501	029D000076	COIL,LINE FILTER	ELF15N003A
L504	02167H220K	COIL	22 UH
L701	021673101K	COIL	100 UH
L1001	02167H220K	COIL	22 UH
L1002	02167H220K	COIL	22 UH
L4002	021LA6100K	COIL	10 UH
L4003	021QA6101K	COIL	100 UH
L4004	021LA6330K	COIL	33 UH
L4005	02167D101K	COIL	100 UH
L4006	021673101K	COIL	100 UH
L4007	021673101K	COIL	100 UH
L4008	021673101K	COIL	100 UH
L4009	021LA6680K	COIL	68 UH
L4010	021LA6390K	COIL	39 UH
L4101	021673101K	COIL	100 UH
L4102	021QA6471K	COIL	470 UH
L4502	021LA6220K	COIL	22 UH
L4503	021LA6220K	COIL	22 UH
L4504	021LA6220K	COIL	22 UH
L4508	021L96220K	COIL	22 UH
L4509	021QA6331K	COIL	330 UH
L4510	021LA6100K	COIL	10 UH
L4802	021673101K	COIL	100 UH
L4803	021673101K	COIL	100 UH
L4806	021LA6330K	COIL	33 UH
L6301	021673101K	COIL	100 UH
L6302	02167D101K	COIL	100 UH
L6304	021673101K	COIL	100 UH
⚠ T501	0481290074	TRANSFORMER, SWITCHING	8129007
T4001	0306260028	COIL, BIAS OSC	3626002
JACK			
J4501	063G100041	SOCKET, 21PIN	035_0_8083_00
SWITCHES			
SW601	0504201T32	SWITCH, TACT	SKQNAE039A
SW602	0504201T32	SWITCH, TACT	SKQNAE039A
SW603	0504201T32	SWITCH, TACT	SKQNAE039A
SW604	0504201T32	SWITCH, TACT	SKQNAE039A
SW605	0504201T32	SWITCH, TACT	SKQNAE039A
SW606	0504201T32	SWITCH, TACT	SKQNAE039A
SW607	0504201T32	SWITCH, TACT	SKQNAE039A
SW608	0504201T32	SWITCH, TACT	SKQNAE039A
SW1001	0550322004	SWITCH, LEAF	HXW0394-010010
P.C.BOARD ASSEMBLES			
PCB010	A4C308B01A	PCB ASS'Y	VM7134B
PCB270	A4C305B27A	PCB ASS'Y	VE7817A
MISCELLANEOUS			
B502	0246T03584	CORE, BEADS	BF40DTA-3.5X6X1
BT601	1412004008	BATTERY MANGAN	R03(AB)E_20_T
⚠ CD501	1206655806	CORD, AC	E2N 6FEET
CD601	06CH23042A	CORD, EIS CONNECTOR	CH23042A
CP501	0694430100	CORD, UX CONNECTOR	2-173270-3
CP651	069E230129	CONNECTOR PCB SIDE	8283_0312_00_000
CD1001	06CH22074A	CORD, EIS CONNECTOR	CH22074A
CD4102	122L052005	CORD, JUMPER	2L052005
CD4106	122L061101	CORD, JUMPER	2L061101
CD6002	06CDL05022	RF CABLE PAL FTZ	EU271CS-2
CP1002	0697150310	CONNECTOR PCB SIDE	TAS-X05X-D1
CP4002	06CH22070A	CORD, CONNECTOR	CH22070A
CP4101	0697760570	CONNECTOR PCB SIDE	TOC-T06X-B1
CP4102	069R750028	CONNECTOR PCB SIDE	52045-0545
CP4105	06972A0580	CONNECTOR PCB SIDE	TKC-G10P-A1
CP4106	069R760028	CONNECTOR PCB SIDE	52045-0645
CUS011	800WF00004	CUSHION-A	

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
		MISCELLANEOUS	
CUS012	800WF00019	CUSHION-C	
⚠ F501	080PT1R602	FUSE	21801.6
FH501	06710T0006	HOLDER, FUSE	EYF-52BC
FH502	06710T0006	HOLDER, FUSE	EYF-52BC
OS651	0771000013	REMOTE RECEIVER	PNA4612M00YB
TM601	07660BM040	TRANSMITTER	SBHR10004A
⚠ TU6001	0162601012	RF UNIT	TMLG1-109A
V651	096F79R004	TUBE FLUORSCENT DISPLAY	SVV-07SS22
X1001	100CA01203	CRYSTAL HC-49/U-S	12MHz
X1002	100C32R803	CRYSTAL DSVT-200	32.768KHz
X4001	100CA4R404	CRYSTAL HC-49/U-S	4.433619MHz

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR